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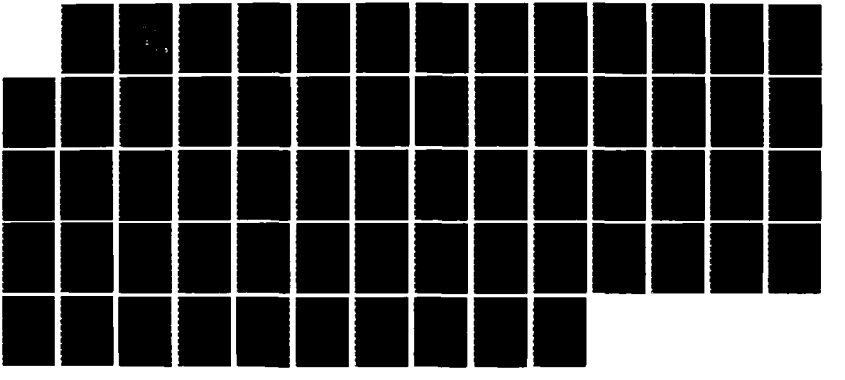

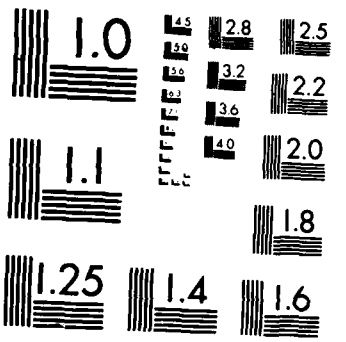

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STRATEGIC STUDIES INSTITUTE
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CARLISLE BARRACKS, PENNSYLVANIA 17013-5050

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A WORLD 2010

A DECLINE OF SUPERPOWER INFLUENCE

Final Report

FUTURES/LONG-RANGE PLANNING TEAM
STRATEGIC STUDIES INSTITUTE
US ARMY WAR COLLEGE
Carlisle Barracks, Pennsylvania 17013-5050

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A WORLD 2010

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FINAL REPORT

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COMMENTS

Comments pertaining to this report are invited and should be forwarded to: Director, Strategic Studies Institute, US Army War College, Carlisle Barracks, PA. 17013-5050

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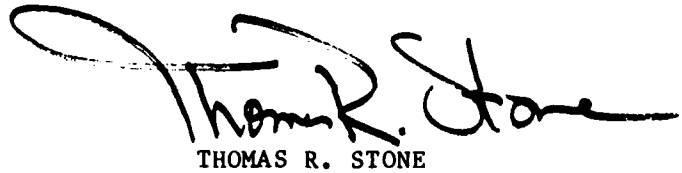
FOREWORD

This Futures Report presents a description of a plausible world environment for the year 2010--one where the influence of the 20th century superpowers is diminished and where new international alignments of nations are on the rise. This configuration of world 2010 places the nations of the world in five groups according to their relationship to industrialization and modernization; they are: postindustrial, advanced industrial, transitioning industrial, industrial, and preindustrial. World 2010, although only one of many that futurists could perceive for this period, is developed by the author based on his interpretation of seven trends existing in the 1980's that are likely to continue beyond the year 2000 to shape the world environment of the 21st century. The trends involve: the international order of nations; population and demographics; economies; energy sources; science, technology, and space; sociopolitical factors; and the military disposition of nations. The scenario created focuses on a multipolar world where new political and economic arrangements of nations are competing for world markets and power, and where a lessening of the influence of the United States and the Soviet Union has occurred.

This report, written by Charles W. Taylor, was prepared by the Strategic Studies Institute, US Army War College, as a contribution to Army long-range strategic planning. The forecasts, inferences, and conclusions contained in the report are those of the author. As such, they do not reflect an official view or approval of the US Army War College, the Deputy Chief of Staff for Operations and Plans, or the Department of the Army.



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CHARLES W. TAYLOR, a faculty member of the US Army War College, is a strategic futurist with the Strategic Studies Institute (SSI) and is a member of its Futures/Long-Range Planning Team. His experience with futures research extends over 20 years during which time he has made major contributions in the form of narrative long-range forecasts and in methods, design, and conduct of forecasts for studies requested by the Deputy Chief of Staff for Operations and Plans for the Department of the Army. He is the author of a number of futures reports including "The Technical Report to Forecast 90," "A Concept of a Future Force," "The Relationship of Forecasting to Long-Range Planning" and the "Pilot Delphi Project," a forecast of strategic issues to the year 2030. Mr. Taylor is the originator of the "Panel Consensus Technique," an internationally recognized contribution to participative decisionmaking, problem solving and forecasting. He has published articles in professional journals, presented papers at symposia, and conducted workshops on forecasting and creative decisionmaking/problem solving for university graduate students, US Army War College students, and Federal, state, and local government groups. He is a member of the International Studies Association, American Academy of Political and Social Sciences, American Association for the Advancement of Science, World Future Society, Population Reference Bureau, New York Academy of Science, Military Operations Research Society, and the Creative Education Foundation.

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EXECUTIVE SUMMARY

Introduction. This Futures Report creates a scenario of a probable world environment for the year 2010. The purpose of this monograph is to provide the Department of Defense (DOD) and Department of the Army (DA) planners and policy makers with the challenges of a plausible world just beyond the usual planning years in the first decade of the 21st century. Moreover, it alerts DOD leadership of situations that they might want to alter or manage prior to 2010 to help make the future world environment more acceptable to the interests of the United States, its allies and friends. The scenario created by A World 2010 has not been described in detail previously in DOD or DA rhetoric.

Too often DOD and DA planners frame their long-range plans and programs for the out years against either of two alternative scenarios: the worst possible situation or a situation which is essentially a continuation of today's world environment. In A World 2010, the environment for the early decades of the 21st century is based on a new international order of nations arranged in a hierarchy of modernization and industrialization which could evolve by the year 2010. Essentially, in the context of world 2010 and in 21st century terms, there are no superpower nations nor are there nations called Third World. All nations are described in terms of industrialization. The purpose is to give some level of status to each nation in the world community of nations. This, theoretically, would increase each nation's self-worth, encourage each to plan and set national goals, and allow each an opportunity to pursue a more self-directed destiny. The 20th century descriptive terms for nations, i.e., more developed, developing, and less developed countries, have not encouraged nations to reach their potential and are inappropriate constructs for the 21st century. The author of this report believes that the 2010 scenario, as created and envisioned by the reader, likely will influence the future of US national security and the US military, especially the US Army.

Method. The author used thematic analysis as the method for the development of this report since the Army does not have a forecast data base and most other forecast data bases are either proprietary or are selectively exclusive. To establish a basis for a scenario, the author has selected seven trends from the latter half of the 20th century and has forecast their consequences to the year 2010. He then uses an holistic approach to combine the consequences to visualize a 21st century world scenario. He follows this with a description of the probable impact on US national security, the likely implications for the US Army and the possible need for the application of military power as an instrument of US national policy. The scenario of world 2010 unfolds as the reader weighs the consequences of the seven trends and considers the possible ways in which they could cause a decline in the influence of the superpowers as suggested by the author.

Whether in agreement or disagreement with the author's trend interpretations, the reader will envision variations of the scenario from his own perspective and impressions of the forecasts. The seven trends selected for this report are those relevant to national security and those most often cited by futurists and planners as published in open and private literature or in government documents. Where information was available, the author used results of published forecasts to support probable or possible consequences of the trends which he projects to the year 2010.

Assumptions. The assumptions used in this report allow the development of a world 2010 environment during a period of peace prior to the turn of the century and the first decade of the new century. The assumptions are:

o Neither general war nor a war between the United States and the Soviet Union or among other major 20th century powers will occur before the year 2010.

o Neither a worldwide economic collapse or a major world depression will occur before the end of the 20th century or in the early years of the new century.

o No major scientific or technological breakthrough(s) will occur which will give one nation the ultimate power of intimidation over all other nations of the world.

Trends. Trends and their consequences were analyzed by the author to determine their impact toward the decline of the 20th century superpowers, the United States and the Soviet Union. The selected trends are:

1. Nations of the world are progressing toward a new order of nations. The categories of nations in A World 2010 are: postindustrial, advanced industrial, transitioning industrial, industrial, and preindustrial.

2. Global population continues to increase. Demographers estimate that by the year 2010 world population will have increased by about 30 percent over 1986, i.e., from 4.9 to 7 billion people. The distribution throughout the new order of nations of the 7 billion likely will be: postindustrial, 14 percent; advanced industrial, 1.4 percent; transitioning industrial, 5.8 percent; industrial, 48 percent; and the preindustrial, 30.6 percent.

3. Interdependence among the world's nations will continue to increase and new economic arrangements are creating an increasingly competitive world economy. Continued increases in interdependence along with the creation of new economic arrangements among nations by 2010 have brought about abandonment of many 20th century economic agreements, the adoption of free enterprise, and a general rise in economic growth for many of the world's nations.

4. The world's nonrenewable energy sources are continuing to dwindle and the use of nuclear energy is rising. By 2010 nations of the

world will have become increasingly aware that fossil fuel could be depleted by or before the end of the 21st century. There are about 40 nations that have nuclear power plants in 2010 to satisfy their energy needs.

5. Great strides will continue to be made in advancements and achievements in science and technology and in space exploration and use. Most nations of the world in 2010 are benefiting from the latest advances in science and technology; nearly all share in the advances except the very poorest of the preindustrial nations. The transfer of technology can be expected to flow unimpeded along with information to all states that have the economic and societal infrastructures that can afford its costs, understand its complexities, and absorb change. Almost all nations are profiting from the peaceful commercial and exploratory use of space. The cost-benefits of such development and activities can be expected in 2010 to outweigh the uncertainties and risks of military weapon systems in space.

6. Sociopolitical changes increasingly are impacting all nations of the world. By 2010 most of the world's nations can be expected to have experienced a sociopolitical reorientation relative to their new status in the order of nations. As new industrial, economic, and technological infrastructures within most nations come into being, nations and their leaders likely will form new views of and make modifications to political processes and social structures. The spread of free enterprise worldwide increasingly could promote a rise of capitalism and an increase in privately controlled industries as well as a growing preference by many people for representative government, and possibly a realization of human rights. By the early decades of the new century both the United States and the Soviet Union can expect to undergo cultural and philosophical changes that are likely to alter their societies.

7. The proliferation of conventional arms throughout most of the world will continue as will nuclear arms capabilities. Most every industrialized nation will be armed with a range of conventional weapons that was supplied to them, for the most part, by the 20th century superpowers before the turn of the century. Many continue to purchase or barter for the latest conventional high-tech weapons in 2010 which are available from new 21st century arm suppliers; additionally, some have nuclear weapons. During the last few decades of the 20th century, proliferation of nuclear weapons can be expected to include 20 or more nations.

The Decline of the Superpowers. The decline of superpower influence is assessed within the context of 20th century notions in terms of factors related to the interpretations of the trends. As the reader reviews the trends against 20th century terms of superpower decline, the postindustrial United States, in most incidences, appears to suffer a decline of economic, political, and military influence. The United States in 2010, as in the 20th century, however, continues to be the most powerful and influential economic and political nation of the world while its military influence is one of quiet military power. The Soviet Union in the 2010 world is categorized as an industrial nation, has turned toward internal economic development, is under new leadership, and is less competitive and

adventuresome. This situation likely will result in less Soviet support to governments and factions worldwide which likely will allow former client and surrogate countries in the Middle East, Africa, Latin America, and Eastern Europe the opportunities to pursue new self-directed destinies.

Findings. The environment created in world 2010 essentially encompasses a peaceful world. It is, however, an environment where world economic competition and tensions are high and where armed conflict remains an ever present possibility. Because most nations of the world are realizing economic growth and are beginning to achieve national goals of internal development, war is an unpopular activity. The notions of being armed, having modern high-tech weapons, and, for some nations, having nuclear weapons and a means to deliver them, psychologically, remain attractive. These national attitudes, shared by nations which are expressing a new self-directed economic individuality in world 2010, create an environment of world apprehension where US national security leadership must be alert and prepared to deter or terminate quickly conflicts that threaten US interests.

The environment of world 2010 creates many challenges to and concerns for a postindustrial United States which will require the utmost in national innovativeness and creativity and in strategic planning and decisionmaking skills. The probabilities of some world events and trends that can be deducted by inference from A World 2010 are listed below according to their relationship to the elements of national power: economic, sociopolitical, science and technology, and military. Probabilities for each event or trend are the opinion of the author and are expressed as "H," "M," or "L," where H = high, .66 and above; M = medium, .65 to .40; L = low, .39 and below; IP = improbable.

ELEMENT	TREND OR EVENT	PROBABILITY
Economic	Competition in world trade	H
	Regional economic agreements	H
	Economic interdependence	H
	US dependence on imports	H
	Economic agreement stability (in 2010)	H
	Commercial use of outer space	H
	Economic growth for most nations	H
	Economic assistance programs	H
	Restrictions on trade	H
	Trade wars	H
	Free enterprise	H
	US/Soviet economic cooperation	M-H
	Soviet economic growth	M
	Influence of 20th century international economic organizations	M
	Redistribution of wealth	M
	Debt repayments	M
	Cartel control over prices and supplies	M
	US dependence on imported energy	L
	Economic agreement stability (20th century)	L
	Increase in disparity of economic growth among nations	L
Socio-political	Diffusion of international power	H
	Ad hoc political alliances/agreements	H
	Rise of nationalism	H
	Cultural values and life-style shifts	H
	Population migration	H
	National pursuit of self-directed destiny	H
	Increase in social investments	M-H
	Improved human rights and quality of life	M-H
	Democratization of governments	M-H
	Alliance cohesion (in 2010, political)	M
	Increase in political freedom worldwide	M
	Spread of authoritarian governments	M-L
	Alliance cohesion (20th century, political)	L
	Influence of 20th century international political organizations	L
	Political instability	L
Science and Technology	Worldwide diffusion of science and technology	H
	Transfer of technology	H
	Diffusion of nuclear power as energy source	H
	Research and Development investments	H
	Development of alternative energy sources	H
	Ecological disaster (non-nuclear)	M-H
	Nuclear power plant accidents	M
	Disparity in distribution of technology	L-M
Military	Effectiveness of US deterrence	H
	Diffusion of high-tech weapons	H
	Development of new weapons systems	H
	Arms control and disarmament	H
	Ad hoc defense arrangements	H
	Cooperative US/Soviet actions to prevent continued nuclear weapons proliferation	M-H
	Arms trade and sales	M-H
	Conventional arms proliferation	M
	Military assistance programs	M
	Stability of bilateral defense agreements	M
	Utility of military forces	M
	Conflict tendency (worldwide)	M
	Low intensity conflict	M
	Conventional conflict	M
	Nuclear weapon accident	M
	Use of a nuclear weapon (nation vs nation)	M
	Use of armed forces	M-L
	Nuclear weapons proliferation	M-L
	Projection of military power	L-M
	Retention and availability of US basing and overflight rights	L
	Stability of 20th century collective defense agreements	L
	Military use of outer space	L
	Weapons in outer space	L
	Nuclear conflict (other than US/Soviet)	L
	US/Soviet strategic exchange	L-IP
	Total war	IP

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Introduction. As the dawn of the 21st century approaches, the world's nations continue the ideological political and economic polarization that dominated the 20th century. Basically, three major camps exist:[1] the democratic-like nations with capitalistic or socialistic economies--the free world; the totalitarian nations, communist, socialist, or nationalist with largely socialistic economies--the "not free" world; and groups of nations in various stages of political and economic growth not necessarily pledged to either of the other philosophical camps.[2,3] These latter nations, variably aligned with one another according to their perceived common interests, increasingly are challenging the world power positions of the major free and not free nations politically and economically.

At the turn of the century, all nations are aware of the beginning of a new reality: an era brought about by evolutionary changes occurring over the past several decades. This reality encompasses new interrelationships that have emerged among nations. Global issues are becoming significantly more complex and relationships are more diffused than in the past. A devolution of global power is evolving and is shifting increasingly from the superpowers of the 20th century to a new order of nations. For some nations, a societal progression from an agrarian society to one that is industrial has transpired; for others, a transition from an industrial society to advanced industrial status, and for a few, a shift to a postindustrial society. The world of 2010 is a pastiche of political and economic power competition, fraught with uncertainties, unpredictable threats, a potential for armed conflicts, and a probability of direct and indirect confrontations enmeshing the great powers of the past. The international environment existing in world 2010, in all likelihood, shows evidence of an evolutionary decline in 20th century superpower influence as measured in terms of devolution of power; demographics and manpower; dependence and interdependence; productivity and trade; sociopolitical and economic prominence; science and technology and technology transfer; and military power and arms transfer.

Based on a new order of nations, this futures monograph will describe the 20th century trends which could create the world 2010 environment. Additionally, it will examine the probable impact of the 2010 environment on US national security, the need for the application of military power as an instrument of national policy, and the possible implications for a future US Army.

A world environment so envisaged, where the status of the 20th century major powers is declining surely could not materialize without underlying assumptions which allow the interactions of the world's nations and fashion the world of 2010. Nor could such a world come to be without indicative trends paving a pathway into the future through the next several decades.

Assumptions. The assumptions for this futures paper address war, world economy, and science and technology. The assumptions allow the development of a world 2010 environment that is free of restrictive societal events. Any occurrence of catastrophic events seriously affecting the assumptions would create a destabilized world environment in which progress toward a world 2010, at most, would be delayed. The assumptions are:

o Neither general war nor a war between the United States and the Soviet Union or a war among other major 20th century powers will occur before the year 2010.

o Neither a worldwide economic collapse or a major world depression will occur before the end of the 20th century or in the early years of the new century.

o No major scientific or technological breakthrough(s) will occur which will give one nation the ultimate power of intimidation over all other nations of the world.

Trends. The environment described here is an aggregation of selected, current critical trends and those of the decades before the turn of the century. These trends, which, in all likelihood, could gain impetus through the 1990's into the early decades of the 21st century, will influence US national security as well as the employment of its military. These trends involve: world international order; population and demographics; interdependence and economic growth; energy; science, technology, and space use and exploration; sociopolitical factors; and the military disposition of nations. Inferential suggestions as to how each trend has contributed toward a decline of superpower influence conclude each trend's description.

World International Order.[4] Nations of the world are progressing toward a new order of five different groups according to their relationship to industrialization and modernization (see Table 1): postindustrial, advanced industrial, transitioning industrial, industrial, and preindustrial.[5] Each is described below.

o **Postindustrial** countries have sociopolitical infrastructures that support predominantly information, service, and knowledge societies with highly developed and efficient communication networks via earth and space systems. Their industries are predominantly science-based and technology oriented, using electronics, computers, optics, and robotics, as well as the intellectual technology of models and simulations. The largest single class of workers, about 80 percent of the work force,[6] is comprised of highly innovative and creative, multilingual, scientifically-oriented professionals and their supporting staffs. Postindustrial economies produce information, services, and knowledge for export as well as for internal use. Their economies also support an abundance of automated and robotic, light fabricating specialty enterprises which encompass about 18 percent of the work force, as well as technoagricultural industries comprised of a mere 2 percent of the work force. The postindustrial nations include the United States and Canada; the European countries; Australia and New Zealand; and Japan. Most of these countries support small, high-tech, sophisticated

POSTINDUSTRIAL	INDUSTRIAL
Canada and United States	China
Europe	Cuba
Japan	India
Australia and New Zealand	Korea, N.
	Korea, S.
	Malaysia
ADVANCED INDUSTRIAL	Pakistan
	Philippines
Hong Kong	Turkey
Israel	USSR
Singapore	Venezuela
South Africa	Vietnam
Taiwan	
TRANSITIONING INDUSTRIAL	PREINDUSTRIAL
Argentina	All other nations of Africa, Asia, Latin America, and Oceania not listed elsewhere.
Brazil	
Chile	
Costa Rica	
Mexico	

Table 1. An Arrangement of Nations in World 2010 by Industrialization and Modernization.

armed forces. Most of the postindustrial countries are considered politically free, while others (in the eastern European bloc except Albania, Bulgaria, and Romania) that have made progress toward freedom can be considered partly free by 2010.[7]

o **Advanced industrial** countries have sociopolitical economic infrastructures that support highly modernized industrial/manufacturing societies. They are goods oriented and produce high-tech products and sophisticated automated and robotic manufacturing equipment. Their primary workers, about 60 percent of the work force, are innovative and creative technologists but are not necessarily scientific professionals. Their products are predominantly for export. This group includes Hong Kong, Israel, Singapore, South Africa, and Taiwan. External difficulties of both Israel and South Africa with neighboring countries have slowed their progress toward developing into postindustrial countries. Moreover, 20th century South African internal issues have held back its economic advancement. Except for Hong Kong, the advanced industrial countries support highly sophisticated, technologically-oriented armed forces. Hong Kong has no armed forces except domestic police, nor does it have Chinese or any foreign forces on its territory. Hong Kong is a special administrative zone of China.[8] Although China also has declared Taiwan as a special

administrative zone with very special privileges for retaining a semiautonomous status as a compromise to full reunification, Taiwan has ignored the declaration.[9] Politically, Israel is the only country of this group considered politically free; the others remain partly free.[10]

o **Transitioning industrial** countries have sociopolitical economic infrastructures that support advanced industrial/manufacturing and agricultural societies. They are products oriented and, primarily, produce advanced, state-of-the-art machinery and machine parts and natural and synthetic food products, clothing, and chemicals, largely for export. People in their work force are about evenly divided (about 30 percent) among manufacturing and industry, agriculture, and extractive processes. The work force, in general, is lacking both intellectual ability and personal incentive for creativeness and innovation. This group includes Argentina, Brazil, Chile, Costa Rica, and Mexico. Within the next several decades (beyond 2010) one or two of the countries in this group (Brazil and Argentina) probably will progress to advanced industrial status as they shift more to automated and robotic systems and their educational systems advance to produce a greater number of creative and innovative, scientifically oriented graduates. In 2010, Argentina, Brazil, and Costa Rica, in all likelihood, will be considered politically free. Chile and Mexico[11] in 2010 will remain partly free but within a decade, also, could be expected to be politically free. These transitioning industrial countries support well-trained armed forces that are equipped with advanced and sophisticated weaponry.

o **Industrial** countries have sociopolitical economic infrastructures that support modernized industrial, manufacturing, and agricultural societies. They produce industrial products of all kinds but are predominantly heavy industry oriented. Their agricultural products are largely for internal consumption but agricultural exports are significant, especially by China. In general, the industrial nations are characterized by centralized governments supported by massive administrative bureaucracies. Workers, in general, are predominantly poorly educated and are managed by an elite managerial corps. Blue and white collar unions permeate many of these societies with varying success, as do attempts to unionize labor in others. An estimate of their work force would place about 60 percent in industry and manufacturing; 30 percent in agriculture and extractive processes; and about 10 percent in services.

This group includes China, Cuba, India, North and South Korea, Malaysia, Pakistan, the Philippines, Turkey, the Soviet Union, Venezuela, and Vietnam. Of these countries, only India and Venezuela can be categorized as politically free; North Korea, the Soviet Union, and Vietnam remain "not free"; and the others, partly free.[12] Most of these nations, in all probability, will require at least a half century before they can develop an infrastructure which will enable them to progress to transitioning industrial status; the remainder, will require a longer time to reach that level. For other countries, such as India, upward progress will continue to be constrained by growing population, social class structure, and religious practices. The Soviet Union, however, has the potential to become to a transitioning industrial country if the highly advanced Soviet European

sector could develop the remainder of the nation. Soviet advancement is hampered, however, by continued imbalances in population growth, ethnic and social problems, a decline of the political influence of the elite Russian ruling class, and by general adherence to outmoded agricultural methods that require a large percentage of the Soviet work force. Moreover, progress in the Soviet Union continues to be impeded by its inability to provide the necessary energy needs throughout its vast society. The industrial countries support large armed forces, most of which are highly trained and equipped with a mixture of sophisticated, advanced and modernized weaponry along with aging weapon systems of the 20th century. The Soviet Union and China, however, additionally have weapon systems with near comparability to those of the postindustrial countries.

o **Preindustrial** countries have a mixture of sociopolitical and economic infrastructures that range from partly industrial to almost completely agricultural. They include the least developed nations of the world, many of which require significant economic and food aid from other nations and world organizations merely to survive. The wealth of the preindustrial countries, for the most part, continues to be lopsided in distribution, where the poor are getting poorer and the rich, richer. The populations of most of these countries are disproportionately large when compared to other countries of the world (except for China and India) and they are continuing to grow at rates significantly above replacement levels. Their work forces are divided among industry (about 30 percent); agriculture and extractive processes (about 65 percent); and the remainder in services. They include the once wealthy oil and the resource-rich countries. They can be subdivided further into nonindustrial countries, which include countries so desperately poor economically (such as Bangladesh and the poor countries of Africa), and those almost devoid of any natural resource base which probably will not survive through the 21st century without massive long-term infusions of external aid.

The preindustrial countries include the remaining countries (not previously mentioned) of Africa, Asia, Latin America, and Oceania. Within this group of countries, only 14 are rated as politically free.[13] The wealthier preindustrial countries support trained armed forces--generally, disproportionate in number to their needs--that are equipped with a mixture of antiquated 20th century weapons and advanced defensive weapon systems according to their ability to pay or obtain credit for arms. To the extent financially possible and as a status symbol, the poorer preindustrial (including the nonindustrial) countries also support small, poorly trained and ineffective armed forces that are mostly equipped with 20th century and earlier defensive weapons or they have no forces and weapons at all and depend on protection from beneficent patron nations.

A trend toward a new order of nations, as described above, in all likelihood, could contribute toward a decline of the influence of the United States and the Soviet Union through a devolution of power, as well as by new patterns of competition and cooperation and the possible common interest of some nations to oppose the influence of both 20th century superpowers. The United States, as a postindustrial state, could find its 20th century influence diminishing since the other postindustrial states, most of which

were once its traditional allies linked directly by security commitments, are becoming even greater competitors for political influence and economic markets than they were in the past. Moreover, the United States might find its need for national and economic security increasingly challenged by these conscientious competitors who are bent on grasping the international industrial influence held by the United States over the past half century. In all likelihood, the industrial and newly industrialized countries will make a rigorous and substantial effort to fill the industrial-influence gap created by the United States as it increasingly applies its international status as a leader in services, information and knowledge.

US political, economic, and military influence in Latin America, which has been deteriorating during the 20th century, likely will continue to decline in the early years of the new century. As the transitioning countries continue to reduce their ties with the United States, form regional political/economic agreements, and increase their international activities, they will increasingly become recognized internationally as a regional economic community. They are also likely to band together in renunciation of US economic and military aid. Moreover, both US and Soviet political, economic, and military influence are likely to decline further as the industrial countries enter into coalition building and begin forming new federations of industrialized states. With a decline of 20th century superpower influence, the international environment could become more involved in North-South issues and their complexities and less concerned about East-West issues and their associated rivalries.

Another possible theory inherent in a new order of nations which likely would promote a decline of superpower influence, especially of the United States, is supported, in part, by the following plausible developments. If large-scale production of goods has been the engine of economic growth and a source of international power for industrial societies of the past, then new centers of power arising from new or future industrial countries become increasingly probable. Again theoretically, as a society progresses from an industrial base to a technological service-information base, it likely may experience a gradual decline of international influence during the transition, i.e., its economic and political influence tend to peak as it achieves industrial capacity and to wane as its industrial base is exchanged for a technological service-information base and is transferred to other nations. Such loss of influence possibly might be irreversible or, at least, might never be recaptured as it previously existed. Furthermore, such a decline need not be accompanied by a loss of international leadership and its associated influence. An example of such leadership by the United States, as well as by other postindustrial countries, could be to assist the industrial and preindustrial countries toward the most effective use of resource conservation and distribution involved in the Law of the Seas treaty. Such acts of leadership by the postindustrial countries, although contributing toward a devolution of power, could increase international demand for the services and information that will become available almost exclusively from the postindustrial societies.

The Soviet Union, relegated to remain an industrial country, while its 20th century rival, the United States, advances beyond Soviet national capabilities, in all likelihood, could be forced to devote more of its national assets to internal development; thus bringing about a decline of Soviet international influence as it reduces external interests and turns toward introspection. In all probability, Soviet Marxist support to governments and factions in the Middle East, Africa, and Latin America would decrease as internal development investments take priority over external ventures. Such a situation in Latin America, e.g., Cuba, as well as in Eastern Europe could give those countries the opportunities to pursue new self-directed destinies.

World Population. Global population will continue to increase.[14]

Projected estimates (see Table 2) indicate that by the year 2000 the world's population will be about 6.2 billion, up 24 percent over 1986, and by 2020, the population can be expected to be about 7.8 billion, an increase of 58 percent over 1986. The largest increase will be in the less developed countries where the total fertility rate (TFR)[15] is about 4.2 children, and the least, in the more developed countries where the TFR is about 1.9; well below the TFR replacement level of 2.1 to 2.5, where population will eventually stop growing, assuming no net migration.

	1986	2000	2020
WORLD POPULATION	4,942	6,152	7,831
MORE DEVELOPED			
North America	267	296	338
Europe (all)	493	508	523
Japan	122	128	133
USSR	280	311	357
Australia & New Zealand	19	21	26
TOTAL:	1,181	1,264	1,377
% of World Population	23.9	20.5	17.6
LESS DEVELOPED			
All other regions or countries	3,762	4,893	6,373
% of World Population	76.1	79.5	81.4

Table 2. Traditional Classification of Nations and Population Estimates for the Years 1986 to 2020* (in millions).

*Population Reference Bureau, Inc., "1986 World Population Data Sheet," Washington, April 1986.

The data displayed in Table 3 indicate that by 2010, the world's population will reach about 7.0 billion and the preindustrial countries will represent about one third of the total population. The postindustrial countries, which do not include the Soviet Union, represent about 14 percent of the world's total population in the year 2010. In the other new order classifications, by the year 2010 the industrial countries will represent the largest group, about 48 percent; whereas, the advanced industrial countries will only account for about 1.4 percent and the transitioning industrial countries, only about 5.8 percent. The new order of nations presents considerable and significant changes from the 20th century.

Demographic data projections to the year 2020 indicate the following significant likely trends: Life expectancy in most countries will continue to increase.[16] In the postindustrial and advanced industrial countries, life expectancy could reach 80 years or older in 2010; in comparison to about 70-75 in the transitioning industrials, 65-70 in the industrials, and 55-60 in the preindustrials (all estimated). Generally, physical well-being will improve; thus, expanding the number of people available for the work force, in need of services and sustainment, and requiring living space. Within most nations in 2010 which are achieving a level of zero population growth or one with declining population, increasing numbers of older people (age 64-75+ years) will be either an economic welfare burden on societies or, as possible and prudently planned, an economic benefit because they will be absorbed into the work force. For many nations, the median population age could approach 40;[17] this would be especially true for the postindustrial and advanced industrial countries. In 2010, the postindustrial and advanced industrial countries could expect to have a shortage of youth at the age of military recruits.

By 2010, most countries will have the potential to provide a relatively better quality of life for their people than they could provide in the past. That is, most people will believe they are better off than they were in the past but they may not believe that they are better off or richer than their neighbor. Thus, migration from the less affluent countries to the more affluent, across contiguous borders as well as to the more remote advanced countries, is likely to continue--regardless of restrictions or other means to control or regulate migration. The postindustrial countries, especially the United States and Europe, can expect significant cultural changes by the year 2010 due to past migration patterns and immigration policies existing over the last three or four decades.

Population and demographic trends could be significant factors in affecting a decline of 20th century superpower influence as well as bringing about a devolution of power internationally. The United States, as a postindustrial country, will have achieved zero population growth, if not decline, barring a continuation of legal (and illegal) immigration, during the 1990's. A decline in the number of available youth (ages 10-19 years) to the turn of the century can be expected; an increase in its population ages 40-69 years; an average population age approaching 40 years; and a life expectancy at birth approaching 85 years of age or older will be continuing trends. These trend projections, if valid, along with the US position as a postindustrial state, have influenced the labor-intensive (mostly heavy)

	1986*	2000*	2010	2020*
WORLD	4,942.0	6,152.0	6,992.0	7,831.0
POSTINDUSTRIAL				
North America	267.0	296.0	333.5	338.0
Europe	493.0	508.0	515.5	523.0
Japan	121.5	128.1	130.3	132.7
Australia and New Zealand	19.1	20.8	23.5	26.1
TOTAL	900.6	952.9	1,002.7	1,019.8
% of World Population	18.2	15.5	14.3	13.0
ADVANCED INDUSTRIAL				
Hong Kong	5.7	6.7	7.1	7.5
Israel	4.2	5.3	5.9	6.5
Singapore	2.6	2.9	3.1	3.3
South Africa	33.2	44.8	57.8	70.8
Taiwan	19.6	22.4	25.2	28.0
TOTAL	65.3	82.1	99.1	116.1
% of World Population	1.3	1.3	1.4	1.5
TRANSITIONING INDUSTRIAL				
Argentina	31.2	37.5	41.6	45.6
Brazil	143.3	194.7	215.7	236.7
Chile	12.3	14.8	16.3	17.7
Costa Rica	2.7	3.6	4.2	4.8
Mexico	81.7	112.8	129.8	146.7
TOTAL	271.2	363.4	407.5	451.5
% of World Population	5.5	5.9	5.8	5.8
INDUSTRIAL				
China	1,050.0	1,190.0	1,300.0	1,410.0
Cuba	10.2	11.6	12.5	13.4
India	785.0	1,017.0	1,103.3	1,189.6
Korea, North	20.5	27.3	32.3	37.3
Korea, South	43.3	52.0	56.7	61.3
Malaysia	15.8	20.6	23.3	26.0
Pakistan	101.9	148.7	172.8	196.9
Philippines	58.1	75.5	87.8	100.0
Turkey	52.3	69.7	79.7	89.6
USSR	280.0	311.0	334.0	357.0
Venezuela	17.8	24.7	30.1	35.4
Vietnam	62.0	85.3	124.8	164.2
TOTAL	2,496.9	3,033.4	3,357.1	3,680.7
% of World Population	50.5	49.3	48.0	47.0
PREINDUSTRIAL				
Africa (less South Africa)	549.8	827.2	1,110.2	1,393.2
Asia (less China, Hong Kong, India, Israel, Japan, North Korea, South Korea, Malaysia, Pakistan, Philippines, Singapore, Taiwan, Turkey, and Vietnam)	533.5	727.5	824.6	921.6
Latin America (less Argentina, Brazil, Chile, Costa Rica, Cuba, Mexico, and Venezuela)	119.8	163.3	199.5	235.7
Oceania (less Australia and New Zealand)	5.9	7.2	8.5	9.9
TOTAL	1,209.0	1,725.2	2,142.8	2,560.4
% of World Population	24.5	28.0	30.6	32.7

*Source: Population Reference Bureau, Inc., "1986 World Population Data Sheet," Washington: April 1986.

Table 3. Projected Order of Nations and Population Estimates From 1986 to 2020. (In millions)

industries during the 1990's to shift operations to robotics and automation; to relocate in a foreign country where a labor force is available, younger, and cheaper; to encourage increased temporary or permanent legal immigration quotas to meet the labor force needs; or to abandon heavy industry and enter computerized, robotic high technology businesses. Trends of the 1980's indicate relocation of such industries--a trend which is highly likely to continue through the 1990's.[18] Consequently, the reduction or loss of the traditional US industrial base (arms manufacturers included), in all likelihood, could be followed by a decline of US international influence.

These same demographics will impact the US military forces. Despite an upturn in the number of males at the turn of the century, fewer male and more female youths likely will be available to the Army as recruits. The average age of male soldiers would be older, whereas the average age of female soldiers would be younger and retention for both, most likely, longer. The Army, however, increasingly would rely on a technology intensive force as manpower availability decreased. Women soldiers likely will perform an increasingly wide variety of occupations and assignments that traditionally were performed by male soldiers. These will include assignments that are combat oriented, e.g., combat service support and combat support. Army presence overseas probably would decrease proportionally to a general reduction in manpower. The willingness of an aging and, possibly, more conservative US population to commit Army forces to small wars, in all likelihood, will increasingly decline--which, if interpreted by some nations as disinterest, also would lessen US international influence.

The consequences of population and demographic trends within the Soviet Union could have a significant effect on the decline of Soviet international influence. Although the Soviet Union will have sufficient manpower throughout its vast regions to maintain a substantial industrial base, its population, in general, will be growing older also, as well as its number of youths declining. Life expectancy in the Soviet Union, generally, can be expected to continue to decline toward the year 2010 as military and space exploration expenditures continue to divert funds from investments in health care delivery.[19] Moreover, a decline in the political influence of the Russian ethnic group, the dominant leadership of the 20th century, and its possible replacement in the central government by non-Slavic ethnic groups, in addition to a general national decline in educational levels, in all probability, could result in a less competitive and adventuresome Soviet Union. Furthermore, although there will be abundant opportunities for the Soviet society to pursue technological equivalence with the postindustrial societies, the less adroit and opportunistic 21st century Soviet leaders likely will be reluctant to adopt innovations which do not conform with their traditional experiences.

World Interdependence and Economic Growth. Interdependence among the world's nations continues to increase, and new economic partnerships are creating an increasingly competitive world economy.

The new order of nations, described in the first trend, will evolve gradually into a world economy which, for most nations, will generate

greater wealth. The resulting redistribution of the world's wealth will especially benefit the transitioning industrial and industrial countries, while simultaneously lessening the economic influence of the 20th century superpowers. Inequality in the redistribution, however, likely will increase in the resource-rich preindustrial countries--with the rich becoming richer faster than the poor become rich. Encouraged foreign capital investments to the transitioning industrial and industrial states from the postindustrial and advanced industrial countries will become increasingly more acceptable, creating a new capital flow and, in all likelihood, a positive shift toward free enterprise in these countries.[20]

The resource-rich preindustrial countries, however, will continue to require substantial and demand constant economic aid. Such aid, in part, will be competitively provided by the industrial countries in return for bilateral, preferential access agreements and, in part, by the postindustrial nations, especially the United States, to sustain some vestige of economic influence. This intense competition for scarce natural resources, needed by almost all of the modernized countries, will keep the cost of resources high. The uneven natural distribution of these resources, found mostly in the preindustrial countries, however, will make the resource-poor preindustrial countries even poorer. Without continued economic aid (emergency and survival) from the International Monetary Fund, the World Bank, and charitable organizations in the form of money, credit, and food and other goods, many of the poorer preindustrial countries will face the prospects of internal upheaval, bankruptcy and complete collapse and, eventually, disappearance as nations.[21] Along with supportive economic aid, however, these nations possibly could survive their increasingly dire situations through the application of agro-technology, which likely could provide both food and employment for their populations as well as their survival as nations. The destiny of these countries could lie more in the elimination of war and strife than it will in the unavailability of food as a source of famine and extinction.[22]

Despite the opportunities for high economic growth in the industrial countries, some economic instability will exist due to continued population expansion and the inability (or unwillingness) of some of these nations to repay long-standing debts.[23] Some, in all likelihood, will form new, regional economic organizations to moderate or eliminate growing economic instability. The infrastructure of these organizations actually will create economic and quasi-political communities which will be either cooperating with or competing against one another, the transitioning industrial, advanced industrial, and postindustrial countries as well as multinational enterprises that operate in almost all nations. The Japan/China/Hong Kong economic and industrial cooperative movement likely will rival all other international and regional organizations for traditional trade markets: those of the European Economic Community, the South American Economic Cooperative, the Latin American Economic Community, and the Association of South East Asian Nations (ASEAN). The growing economic relationship of Israel and South Africa also can be expected to make inroads into these markets.

The world's economy in 2010 could operate with an interdependency that has fewer economic (trade) restrictions among nations, although some industrial countries will still rely on traditional embargoes and protectionism. Information to accelerate economic growth will be readily available to all nations via telecommunications services provided by proprietary space satellites of the postindustrial and advanced industrial countries. The purchase of the telecommunications technologies will include a package comprised of equipment, training, and long-term maintenance assistance. Such arrangements will overcome the attempts of a few industrial countries to control the transfer or limit the employment of these technologies. Thus, many newly industrialized countries could leap over early stages of industrialization and enter the world's markets with products produced with the most advanced industrial technologies and processes provided that they incorporate them into their economies.[24]

Trends in the world's economy, in all likelihood, will contribute significantly toward a decline of superpower influence as well as toward a devolution of power. The so-called interdependence among 20th century nations, in itself, suggests a shift as well as a diminution of power status from the superpowers and other large industrial countries to nations which possessed less power status during the 20th century. This is especially true if interdependence is viewed as an instrument for international leverage which had been used artfully by the 20th century superpowers with other nations to acquire such needs as critical resources or military base and overflight rights in exchange for economic or military aid or protective security.

Increasingly, a role reversal between the "haves" and "have-nots" will occur which will relegate the superpowers to a status of dependent bargainers, especially for scarce resources, and the nations possessing the resources to a position of control or power. Thus, increasingly, the formerly "have-not" nations could demand most any form of payment or exchange they desire, e.g., modernized industrial, mining and processing equipment or entire plants; high-tech systems and materiel; or advanced military systems. Interdependence, then, increasingly will become less of an equal dependency arrangement among nations, especially between the 20th century superpowers and lesser countries. The 20th century superpowers, which formerly dealt from a position of strength--political, economic, or military--increasingly in the 21st century will be unable or unwilling to use this strength, short of war, as the lesser countries enter a new economic order for the redistribution of wealth and its adjunct, power.

New trade and gold flow patterns in the international economy can be expected to develop which are likely to displace the economic primacy of the 20th century superpowers, especially that of the United States. Within the new order of nations, regional increases of international trade can be expected to include embargoes, trade wars, and protectionism. New regional economic institutions to counteract any economic instability could come into being. Common regional interests could exclude the 20th century superpowers from membership in these institutions. An economic integration effort in the 1990's by the transitioning industrial nations, for example, could make the Latin American region self-sufficient in minerals and energy needs.

Moreover, these nations could engage in a broad industrialization undertaking throughout Latin America to reduce imports, spur exports, and, in general, raise the regional industrial level while excluding the "Colossus of the North." Such an arrangement could encourage the participation of Cuba (after Castro) which increasingly could be less supported by the Soviet Union during this time frame and could be searching for peaceful means to bolster its economy. By the year 2010, the debtor, transitioning industrial countries, quite possibly, will be increasingly financially able to begin principal and interest payments on their remaining debts, if they so choose.

World Energy. The world's nonrenewable energy sources, petroleum and other fossil fuels, will continue to dwindle.

Sometime early in the latter half of the 21st century, conventional oil reserves of the world could approach depletion[25] (barring any major discoveries of oil in China or elsewhere or from offshore drilling before or shortly after the turn of the century). The cost of pure oil, as well as that with added extenders, very likely will become increasingly prohibitive for any practical use. The world will continue to remain dependent on oil supplies, to some extent and at least through the early decades of the new century, from the 20th century Organization of Petroleum Exporting Countries (OPEC), if it remains in existence; an OPEC-like cartel; splinter cartels; or individual oil-rich countries. However, production and use of coal as well as nuclear and renewable energy sources will increase substantially over the long term--especially, coal.[26]

Toward the year 2010, most of the postindustrial, advanced industrial, transitioning industrial, some of the industrial, and a few preindustrial countries increasingly will expand or begin their use of nuclear power as an energy source (see Table 4). Despite legal, technical, high cost setbacks and notable accidents, as well as demonstrations of social disapproval during the 1980's and 1990's that resulted in a slowing of nuclear power plant development (particularly in the United States, Canada, Europe, and Japan) nuclear facilities under construction or repair can be expected to be completed early in the new century. However, since the life span of reactors is 10 to 40 years, some plants by 2010 likely will be shut down and decommissioned. Notwithstanding, the share of electricity inputs from nuclear sources by 2010 likely will reach 25 percent in the United States.

The share of electricity generation provided by all renewable sources (hydropower, geothermal, wind, solar) as well as by nuclear sources can be expected to continue to increase in the postindustrial, advanced industrial, and transitioning industrial countries.[27] At least a third of the industrial countries, most of which will have preferential bilateral agreements with cartels or the oil-rich countries, will continue to rely almost entirely on petroleum as their primary source of energy. However, along with inefficient utilization, they will show little concern for its eventual depletion. Nine industrial countries, in all likelihood, will possess or increase their use of nuclear energy. The remaining industrial and the preindustrial countries will use coal followed by gas and oil as their primary sources of energy. A few of the preindustrial countries (see Table 4) also can each be expected to have at least one nuclear power plant.

Postindustrial	Transitioning Industrial
Austria	Argentina
Belgium	Brazil
Bulgaria	Chile
Canada	Mexico
Czechoslovakia	
Finland	
France	Industrial
Germany, East	
Germany, West	China
Hungary	Cuba
Italy	India
Japan	Korea, North
Netherlands	Korea, South
Romania	Pakistan
Spain	Philippines
Sweden	Soviet Union
Switzerland	Vietnam
United Kingdom	
United States	
Yugoslavia	
	PREINDUSTRIAL
Advanced Industrial	
	Egypt
Israel	Iran
South Africa	Iraq
Taiwan	Saudi Arabia

Table 4. Estimate of Nations Possessing Nuclear Power Plants in 2010.

Competition, especially among the industrial countries, for nonfuel scarce minerals, vital to industrial production, will grow increasingly keen--creating situations with high potential for precipitous international crises. Although no nonfuel mineral depletion problems are projected for at least the first 50 years of the new century, production of the nonfuel minerals will continue to be highly energy intensive and could result in problems of meeting world demands.

The increasing demands for energy, primarily the fossil fuels, by the industrial and newly industrialized countries during the early decades of the 21st century, in all probability, will approach a warning, short of crucial, stage. Only then can the recognition of the need for moderation in the use of fossil fuels be expected. Likewise, the need for alternative and sustainable energy sources by the industrial nations will begin to become a reality.

For most of these nations, their search for culpability for their energy problems, more than likely, will be imputed to the 19th and 20th century industrialized countries, especially the United States, Europe, and the Soviet Union. The United States not only will be faulted by the industrial nations but also will be assigned the brunt of the responsibility for its scientific, technological, and economic disinterest as well as neglect toward the development of new energy alternatives for the world's industrial needs. Although the European sector of the Soviet Union increasingly will provide nuclear energy for much of its industrial growth, the greater part of the nation in 2010 will still depend on fossil fuels, primarily oil. It probably will sacrifice its European influence as it becomes increasingly protective of its oil reserves by exporting less to Europe and other nations.

World Science, Technology, and Space Exploration. Great strides will continue to be made in advancements and achievements in science and technology and in space exploration and use.

Most all societies will benefit economically (limited only by their ability to finance) and socially (limited only by their capability to absorb) from the almost constant flow of scientific and technological innovativeness and discovery that will emerge by the year 2010. After the turn of the century and by the year 2010, the creations of science and technology will permeate extensively throughout almost all nations of the world. Their impact on the many different world societies will vary considerably. Increasingly, the diffusion of science and technology within the societies can be expected in some ways to alter many societal aspects. Some societies will accept the diffusion enthusiastically since they will perceive it as creating new opportunities and benefits; while others will seem to reject or retard the diffusion since they will perceive it as a threat. Thus, the diffusion of science and technology throughout societies will create a dialectic conflict.[28] In general, innovations in science and advancements in technology serve all mankind and their attributes can be expected to cross virtually all cultural barriers in the long term.

If the innovations of science and the advancements of technology are absorbed throughout a society, the chances are good that they could improve economic growth as well as the general quality of life and standard of living. For the postindustrial, the advanced and transitioning industrial, and a few of the industrial nations, the opportunities for economic growth provided by the diffusion of science and technology within their societies will be abundant and rewarding.

For some of the newly industrialized and industrial countries, including the Soviet non-European sector, diffusion of science and technology could be perceived by their leaders as threatening and devastating to the livelihoods of their citizens and the lands they work, as well as dehumanizing to their well-being and an infringement on their self-image. Imbalances, however, in the distribution of skills and trained workers to accommodate 21st century science and technology increasingly will be reflected from nation to nation in the rate of national economic growth, especially if the more technologically advanced nations continue to provide mostly appropriate technologies and deny the transfer of advanced and high technologies. Moreover, diffusion could change or even replace traditional work values,

affect societal morality, and create severe unemployment problems for some cultures, especially those of the newly industrialized and a few of the preindustrial countries.

For the preindustrial nations, especially those with subsistence economies, diffusion will continue, as it did during the 20th century, at a slow pace which will continue to make only a marginal impact on their societies and will be unlikely to exceed their social limits of growth. Many of the preindustrial countries likely will be unable economically to afford, skillfully to use, or intellectually to absorb and understand 21st century science and technology. These preindustrial nations, largely, will continue to depend on the appropriate technologies provided by benevolent nations. This situation could foster, if not encourage, the more adept members of these preindustrial countries to immigrate, legally or illegally, to other nations in search of economic well-being and a higher standard of living. Thus, the 20th century manpower and brain drain will continue. The loss of one nation's skilled craftsmen and intellectuals to another nation is an undesirable situation which likely could contribute toward the decline of superpower influence, especially if one of the superpowers (e.g., the United States) is their destination.

The postindustrial countries will continue to lead the world of 2010 in the advancement of science and technology. With few constraints, they will share these advancements as well as those in space exploration and use with many other nations of the world including the wealthy preindustrial nations. In general, their space activities will become increasingly more practical, i.e., commercially and industrially oriented. The postindustrial societies, sparked by many successful achievements over the past several decades and fired by the growing rewards (intellectual and monetary) of creativeness, will be engrossed in 2010 in the development of probably even greater achievements in the technologies and advances in the sciences. Specifically, their endeavors largely will concern the following technologies and sciences.[29]

Technologies:

- Power: energy, propulsion, laser
- Space: satellite, vehicles, medicine
- Electronics: information, communication, computers, robotics, artificial intelligence
- Materials: design, construction, composition
- Food: agro-chemical, synthetic, preparation, storage
- Medical: biogenetics, bionics
- Management: command, control, design, training
- Intellectual: simulators, simulations, models

Sciences:

- Physical: physics, chemistry, mathematics
- Environmental: terrestrial, oceanographics, atmospheric, space
- Engineering: electronics, civil, mechanical, metallurgical
- Life: biological, medical, behavioral, social

The intense pursuit of science and technology into the early years of the 21st century by the postindustrial (primarily) and the advanced industrial societies, along with their activities in space (especially for peaceful purposes), in all probability, will continue to be economically, politically, and socially transforming for most nations of the world. The results of the postindustrials' efforts not only will advance them in constant improvements in their internal use of information and services but also in their worldwide export of information and services. In all likelihood, science and technology significantly will influence, and could well shape, the international behavior of most all of the world's nations.

The advanced industrial societies of Hong Kong, Singapore, and Taiwan will continue to be the primary innovative leaders in the development of commercial applications and product merchandising of advanced technologies, especially high-tech, computerized systems. Israel, South Africa, and the transitioning industrial societies will pursue more pragmatic uses of scientific and technological advances and will export robotic and automated equipment, largely to the industrial countries. The transitioning industrial countries, for the most part, can be expected to be more methodically motivated toward gradual advancement than driven by creative inspiration or prompted by incentives until educational improvements and advancements are made within their countries.

The international demands for, the expanding utility of, and the potential worldwide benefits from science and technology will continue to increase the need for transnational information exchange among the scientific, business, and industrial communities. Restriction of the free flow of such information as well as products, by one nation or by several collectively, however, could impede world economic progress and deny potential benefits to others. The use of such information selectively for military purposes by some nations to develop new weapons and improve others, in all likelihood, will continue. The benefits of the free flow of information, however, could outweigh the risks of such developments, compromise such endeavors, or allow the development of counter weapons by adversary nations. Moreover, world public opinion quite likely will reflect disfavor toward the perpetrating nation(s). Although the protection of highly sensitive military scientific and technological information will remain of utmost importance to the postindustrial countries especially, denial or restriction of the export of such information will become increasingly difficult.[30]

The transfer of technology to other nations from the postindustrial and the advanced industrial countries increasingly can be expected to flow unimpeded by the year 2010. The governments of most of the postindustrial and advanced industrial societies can expect to experience decreasing control over technology transfer as well as a loss of technological superiority. Another reason for unimpeded flow will be that the exported technology will include inseparable compatible and integral technological information and hardware, the knowledge and possession of which are essential for the most effective use of the technology. Because of the increasing availability of dual-use technological information, the military establishments of the postindustrial, especially, and the advanced industrial countries will be as dependent on high technology as any of their

potential adversaries. Comparable technological vulnerability, in all likelihood, will encourage the development of potentially more effective strategies and operations for the use of military forces and associated military technologies.

Space sciences and technologies will flourish in the early years of the new century, as will space exploration, especially in the postindustrial societies and the Soviet European sector. The cooperative use of space for communications will be available to almost all nations of the world. Low-cost, state-owned stationary communication/information satellites will be commercially within the means of many preindustrial countries. Moreover, the acquisition of knowledge and information relative to the planet Earth (weather, atmosphere, resources) and its moon, increasingly will become a competitive endeavor of not only the postindustrial states but also of many other nations including China, India, and the Soviet Union especially. Such endeavors very likely will result in the development of services and commodities especially marketable to the advanced industrial and industrial countries, such as shuttle travel to and from space, and in-space-to space platforms or, the providing of resources (minerals) from space-based sources. Opportunities by 2010 for industrial and manufacturing space-based facilities for special processes and the production of specialty items increasingly will become available as will space-based medical care centers and a variety of laboratory and manufacturing stations.[31]

By 2010, all nations will have access to satellite communications systems through independently or collectively owned private-sector or state-owned satellites. By the mid-1990's, the first orbital manned or robotic space platform can be expected to be available for automatic facilities for manufacturing purposes at an estimated rental of $3 to $5 million per month (1984 dollars).[32] As the benefits and advantages of space-based industrial activities are realized and the costs are reduced, the number of operational space stations can be expected to increase as will manned exploratory planetary missions. Sometime in the early decades of the new century manned missions to the planet Mars will be attempted;[33] low-Earth orbit manned, modular space stations will be established;[34] and a manned moon station could well exist.[35] The need for sharing exploratory findings of manned and unmanned planetary excursions and asteroid encounters will be increasingly important, especially for locating and exploiting new sources of critical minerals. Sharing the costs for the peaceful use of space by groups of nations or by private-sector industries will make space activities more affordable, increase incentives to participate, and provide an increasing sense of unity in space endeavors.[36]

As for other uses, such as military, space will remain the singular most effective "forward observation post" for all nations that have space technology since the chances are good that all the world will be in clear view by the year 2010. Most of the postindustrial nations, however, will have a military space capability should its need arise; as will the industrial nations of the Soviet Union, China, and India. The cost-benefits of the peaceful development and utilization of space during the late 1980's, the 1990's, and the early years after 2000 probably can be expected to far outweigh the uncertainties and strategic risks of the US space-based

ballistic missile defense--the Strategic Defense Initiative (SDI) efforts of the 1980's and 1990's.[37] The knowledge gained, the opportunities created, the capabilities achieved from the SDI efforts in space-based defense, in all probability, can be expected to encourage increasing private-sector investment as well as facilitate economically beneficial cooperative and peaceful space activities among many nations. Around the turn of the century, many US space-related technological achievements likely will be shared and the cooperation could provide many new opportunities for economic growth, especially for the United States, Europe, and Japan.

Advancements in science and technology, whether space-based or land-bound, increasingly can be expected to be shared by most all nations. The transitioning industrial societies are likely to be more pragmatic in the use of new innovations than driven by creative inspiration. The more universal use of technology and its transfer--so carefully regulated during the 1980's and early 1990's by restrictive measures to retard the rapid economic and military growth of some of the industrial and newly industrialized countries or to protect sensitive military information from reaching others--will create a healthier, more viable and competitive world economy. The general exploitation of technology, however, could create new national and international problems.

Most of the manufacturing and heavy industrial facilities that will be in the new industrial countries and in those that are modernizing likely will incorporate the latest in up-to-date equipment and processes, which will be automated and electronic in most instances. These facilities will be more energy intensive than labor intensive than was the old industrial base they will be replacing. Consequently, a great potential for serious national problems of unemployment will be created which could have international impact. Moreover, new problems and patterns of industrial environmental damage and pollution can be expected to arise. Chances are good that there will be Arctic haze and acid rain from Soviet and Chinese heavy industrial pollutants; human health problems related to hazardous wastes from high-tech industries or atmospheric damage to the ozone layer; as well as problems related to the disposal of nuclear wastes from industries (including spent nuclear power plants) and the military (resulting from arms reduction agreements). Meanwhile, other regional pollution problems and patterns can be expected to abate--such as acid rain in North America, Europe, and elsewhere. Technology, over the long term, however, can be expected to reduce or eliminate the environmental problems associated with industrial toxic wastes and possibly even nuclear wastes. However, the growing problem of unemployment in most nations of the world, in all likelihood, will not find easy remedy except by new capital investments.

In all probability, if a reluctance to share the means for scientific and technological development equitably continues into the 21st century (as it was monopolized and protected primarily by the superpowers and other industrialized nations during the 20th century, hence the technological gap between the developed and the developing and less developed countries[38]) it will likely contribute toward the decline of superpower influence in terms of military power, economic status, and ideological preference.

Moreover, the fixation of the United States and the Soviet Union during the 20th century on their perceived threat to each other along with their proclivity toward arms races, their general preoccupation with building up their military establishments, and their relative disinclination and disinterest in supporting peaceful scientific and technological programs adequately probably can be expected also to contribute toward their decline of political as well as economic influence in the new century.[39]

Many of the other nations of the world, especially the industrials, will continue to mirror the military images of the 20th century superpowers as they advance into the 21st century. In the early decades of the new century, they will increasingly perceive real and imagined military threats by other nations to their economic progress. In all likelihood, they will increase their arsenals with the most advanced military weapons they can afford through arms transfer mostly from those nations continuing in the arms trade business, while at the same time acquiring the latest industrial technology to advance their economic growth.

World Sociopolitical Change. Sociopolitical change, which is constantly occurring within and among most nations, although slowly and randomly in the world today, increasingly will affect almost all nations of the world. The chances are good that change in most nations likely will occur more rapidly as well as orderly over the next three decades.

The increasing freedom of unconstrained information and knowledge exchange along with the ease of international communication can be expected to be the pacesetters around the globe for sociopolitical change. By the year 2010, most of the world's nations can be expected to experience dramatic reorientation relative to the development of their new status in the order of nations. As these nations build new industrial and economic infrastructures, they probably will form new views of and make modifications to their internal political processes. Also, in all likelihood, they will assume new national identities in the community of nations as well as establish new international relationships more compatible with and advantageous to their needs and interests. Along with these changes, however, there could arise a new growth of nationalism which, in all probability, could lessen the impact of any world cooperative movements, e.g., the New International Economic Order and the Non-Aligned Movement, as well as those of international organizations, e.g., the United Nations. Moreover, this new nationalism, in all likelihood, seriously will weaken the bonds (or threaten the survival) of long existing alliances, e.g., NATO, the Rio Pact, and the Warsaw Pact, as, increasingly, interests of the alliances, national planning, and social investments conflict.

Over the next few decades, the relocation of heavy industries (due in part to the economic attractiveness of newly industrializing countries and to displacement by the rapidly growing service/information industries) from the postindustrial countries to the industrial countries not only will encourage new trade and economic alignments but also will create new competition. Moreover, it likely could result in new international political arrangements as well as new military alliances. The inclination toward and the development of free enterprise in many states (which, during

the 20th century, had no such leanings) increasingly could promote a rise in capitalism,[40] a preference and desire for more representative government,[41] and bring about a realization of human rights, civil liberties, and social justice. Overall, the opportunities available to all nations by the year 2010, in all likelihood, will foster national expectations, many of which could be fulfilled.

The general decline of influence, in terms of a loss of political and economic clout of the 20th century superpowers, may be attributed to a number of indicative sociopolitical related trends and possible events:

o The growing interdependency of nations, especially the superpowers' dependency on other nations for critical resources, in all likelihood, will increase the political obligations, accommodations, and compromises the superpowers must make to other nations.

o The increasing possibility of the exclusion of superpower participation and membership in the formation of cooperative movements, alliances, and other international relationships among nations traditionally aligned with one or the other superpower, likely, will decrease the political and economic effectiveness of the superpowers.

o The possible unification of East and West Germany or the uniting of North and South Korea,[42] in all probability, will have broad implications from which many new trends could emerge which not only will affect both superpowers but also almost certainly will contribute toward the decline of the 20th century superpowers' sociopolitical and military influence.

o The increasing assumption of greater and more rigorous roles in international economic and political activities by the transitioning industrial, industrial, and some of the preindustrial countries, although raising their sociopolitical expectations, will contribute steadily toward the decline of superpower political and economic influence.

o An increasing disillusion in many industrial and preindustrial countries during the late 1980's and 1990's in the ability or willingness of the 20th century superpowers to solve serious world problems, e.g., food distribution, starvation, and environmental pollution, will persuade these countries to search elsewhere for solutions.

o Increasing changes in the cultural makeup of the 20th century superpower nations, in all probability, will be reflected in their national and international plans, strategies, and policies in the early decades of the new century. For example, the United States by the year 2010 could be approaching a population composition that is a third black, Hispanic, or Asian where the white, non-Hispanic influence likely will no longer dominate national and international interests and policies. These cultural changes could result in unbalanced US interests, plans, strategies, and policies favoring Latin American and Asian countries. Similarly, the Soviet Union by the year 2010 will experience generational and attitudinal changes as well as likely ethnic changes in leadership (e.g., from the Russian ethnic group

to a non-Slavic, traditional, and younger ethnic group) which could result in a lessening of the central government's authority, more liberal human rights, and in bringing significant changes in Soviet national and international policies and in Soviet internal economic recovery.[43,44]

The increasing erosion of the international preeminence of the United States and the Soviet Union through economic and sociopolitical changes well into the new century is quite probable. The decline of 20th century superpower influence probably would be proportional to the number of nations sharing or competing for 21st century influence. The possibility of the rise of a new economic superpower, e.g., Japan or possibly China, in all likelihood, would contribute substantially to a decline of US and Soviet influence as will their trade-off of military power for economic influence.

World Military Status. The proliferation of conventional arms throughout most of the world will continue as will nuclear arms capabilities.

Many nations of the world in the early decades of the 21st century, in all probability, will be keenly interested in maintaining a semblance of a peaceful attitude toward contiguous neighboring nations, nations within their regional sphere of relations, and nations more remote from their borders with whom they trade. As a result of the modern industrialization in most nations and the increasing realization of the national benefits derived from economic growth and of the sociopolitical recompenses attributed to the spread of worldwide free-enterprise systems, in all probability, most nations will tend to moderate growing nationalism and will attempt to avoid armed conflict. Most 20th century collective and bilateral political/military alliances and agreements, if neither dissolved nor abrogated, will give way to new economic agreements. Notwithstanding, there is a good chance that because of the increased competition for the necessary resources to function as industrial states as well as each nation's perceived threats to its national security and growing economic assets, virtually all but the very poorest nations will invest in a military establishment with graded conventional capabilities, at least; others, in addition, will invest in a very modest or better nuclear capability.

Most nations, except the very poorest, will demand the most advanced conventional systems they can afford or barter for, from a broader and different source of arms suppliers than existed before the turn of the century. Thus, the potential for conflict, in all likelihood, will continue to be highly volatile. The proliferation of nuclear weapons, in all probably, will increase. Chances are better than even that by 2010, the number of nations acquiring a military nuclear capability could approach 20 or more (see Table 5). Thus, there is likely to be, at most, an even chance that a nuclear weapon accident, nuclear blackmail, or a limited nuclear conflict between small nations will occur. The chances are good that the potential for conflict will increase as will the probability of direct or indirect involvement of other nations if the potential for nuclear weapons proliferation, in fact, does occur.

POSTINDUSTRIAL	INDUSTRIAL
France[1]	China[1]
Japan[3]	India[2]
United Kingdom[1]	Pakistan[2]
United States[1]	North Korea[3]
West Germany[3]	South Korea[3]
	USSR[1]
ADVANCED INDUSTRIAL	Vietnam[4]
Israel[2]	
South Africa[2]	PREINDUSTRIAL
Taiwan[3]	
	Egypt[5]
TRANSITIONING INDUSTRIAL	Iran[5]
	Iraq[5]
Argentina[4]	Libya[5]
Brazil[4]	Saudi Arabia[5]
Chile[4]	

1= substantial, 2000 or more; 2= significant, 1000 or less; 3= moderate, 500 or less; 4= modest, 100 or less; 5= very modest, 50 or less.

Table 5. Hypothetical Estimates of Nations Possessing Nuclear Weapons in the Year 2010.

The military status of the world's nations within each international order is summerized as follows:

o The postindustrial societies--the United States, Canada, the European countries (excluding the Soviet European sector), Australia, New Zealand, and Japan--in 2010 support small, high-tech, sophisticated armed forces. The forces of the United States, Canada, and most of the European countries (those formerly from the Western bloc and less those formerly from the Eastern bloc) include both defensive and offensive conventional and nuclear capabilities. Their forces are trained and equipped to deploy rapidly worldwide for operations on land and sea as well as in and from space. Although these nations support active high-tech forces small in number, the full strength of their military power is invested in a highly trained reserve component which is large in number. The active forces are perceived to be capable of resolving most national interest threatening contingencies while the reserve forces are perceived to be fully capable of meeting more demanding contingencies but are less rapidly deployable. The forces of Australia, New Zealand, and most of the European nations (those formerly from the Eastern bloc), while not unlike the forces of the other postindustrial countries, do not maintain significant offensive capabilities. The postindustrial nations, with the exception of New Zealand

and the former Eastern bloc nations, are world suppliers of software and hardware for high-tech military equipment and weapons. The nations in this category possessing a nuclear weapons capability include the United States, the United Kingdom, France, West Germany, and Japan.

o The advanced industrial societies of Israel, Singapore, South Africa, and Taiwan in 2010 support highly sophisticated, technologically oriented armed forces. The advanced industrial society of Hong Kong has no armed forces except domestic police. The forces of Israel, Singapore, South Africa, and Taiwan include both defensive and offensive conventional capabilities, while Israel, South Africa, and Taiwan, additionally, possess significant to moderate nuclear capabilities. Their operational capabilities are limited in range and are considerably less than those of the postindustrial nations. Although their forces are highly mobile and they can conduct land, sea, and air operations with great efficiency, their capabilities for military space operations are only modest. Their principal military strength is in the mobility and rapid strike capability of their active forces which are large in number compared to their reserve components. All of the advanced industrial nations rely on conscription for their forces. The advanced industrial nations of Israel, South Africa, and Taiwan are world suppliers of technologically sophisticated weapons.

o The transitioning industrial societies--Argentina, Brazil, Chile, Costa Rica, and Mexico--in 2010 support well-trained armed forces that are equipped with advanced and sophisticated weaponry. Of these nations, Argentina, Brazil, and Chile have volunteer active forces fully capable of defensive (primarily) and offensive conventional operations and modest nuclear operational capabilities all limited to within the hemisphere. The size of their active forces is small and their reserve components even smaller. Costa Rica and Mexico have highly capable elite active and well-trained defensive conventional forces; they have no nuclear capability. Mexico's elite forces, additionally, are supported by larger, less well trained, and cumbersome troops which exist only to absorb a portion of the unemployed population.

The principal interest of the transitioning industrial countries is to continue increasing their economic growth. Their investment in a military establishment, primarily, serves only to protect their national and economic interests as they perceive threats within their sphere of economic influence. Since these five nations are bound together within a Latin American Economic Community, their military arrangement serves as a watchdog over other Latin American political and economic activities, especially where nations not of the hemisphere interject their interests or influence. Although they have no interest in projecting their military power beyond the hemisphere, their military are capable of land, sea, and air operations, while their military space activities, essentially, include only shared intelligence and communications. Argentina, Brazil, and Chile are world suppliers of advanced high-tech conventional weapons systems.

o The industrial societies--China, Cuba, India, North and South Korea, Malaysia, Pakistan, the Philippines, Turkey, the Soviet Union, Venezuela, and Vietnam--in 2010 support large armed forces, most of which are highly trained and equipped with a mixture of sophisticated, advanced and modernized weaponry along with aging weapon systems of the 20th century. All rely on conscription to acquire their troops. The number of forces and weapons for the industrial countries are commensurate to their perceived need for an offensive posture which they believe will assure protection of their interests and noninterference in the supply of their industrial resources. As such, they tend to be aggressive in their relationships with the resource supplier nations as well as with the other industrial nations. The industrial nations, in general, are the world suppliers of modernized conventional weapons to selected client nations, many of which are the resource supplier nations. The competition for arms trade and transfer among the industrial nations is keen. Where possible, they station small contingents of armed forces to protect their interests and provide military training to client states, and to signal all other nations that they are the controlling force of the distribution and price of selected resources.

Of the industrial nations, the most formidable forces by 2010, in all probability, are those of the Soviet Union followed by China where their capabilities are of near comparability to those of the postindustrial nations. Although the Soviet European sector possesses military comparability with that of the United States, the non-Russian Soviet leadership of the 21st century is likely be more concerned with resolving its internal economic and social problems than with maintaining its one-upmanship and competition with the United States. Most of the industrial nations, including the Soviet Union and China, however, have reduced the overall numbers of their military troops, although the size of their forces remains formidable, in order to support their labor-intensive economies and to advance their economic growth.

Those industrial nations possessing a substantial nuclear weapons capability in the year 2010 include China and the Soviet Union; those with a significant capability include India and Pakistan; North and South Korea possess a moderate capability; Vietnam, a modest capability; and Cuba, Malaysia, the Philippines, Turkey and Venezuela, none. Of the industrial nations, the Soviet Union possesses the most significant military space capability, although it is essentially a residual of an advantage gained in the late decades of the 20th century. In 2010, Soviet internal economic development investments have moderated its military space ventures. China and India have a modest military space capability, while the remaining industrial nations use space only limitedly for intelligence and communications.

o The preindustrial societies include those nations that have taken least advantage of the opportunities for industrialization or modernization of existing industries. Some have declined to advance by choice, others because of strong fundamentalist aversion to modernization, and others because of their impoverished economies and lack of natural resources. The preindustrial nations--the remaining countries not previously mentioned in

Africa, Asia, Latin America, and Oceania--support small forces that are trained and equipped with a mixture of antiquated 20th century weapons and advanced conventional defensive weapon systems or that are poorly trained and equipped with even older defensive weapons. For some, particularly those with high-demand natural resources, military status is reinforced by foreign troops stationed in their countries for the purpose of protecting and maintaining the disposition of their resources. Indigenous guerrilla forces continue to persist in a few countries each in Africa, Asia, and Latin America. They are small in number and modestly equipped with sophisticated conventional weapons and are trained and supported by foreign sources, i.e., those industrialized countries in need of scarce resources with leaders that believe a change in local government would increase their share of resources. The very poorest preindustrial countries, especially in Africa, have no forces or weapons at all and are in the process of dissolution and amalgamation, i.e., restructuring for the purpose of the creation of new states.

Within this range of forces in this group, there is a good chance that five of the preindustrial countries will possess a very modest nuclear weapon capability by 2010; they are Saudi Arabia, Libya, Iraq, Egypt, and Iran. Additionally, these nations are armed with regional and global threatening ballistic missiles with high accuracy and large conventional or nuclear warheads. Any of these nations so armed are capable of altering the regional balance of power.

The continuation of the proliferation of conventional and nuclear weapons, in all likelihood, will contribute toward the decline of 20th century superpower influence. The belief by some nations of an unwillingness or an inability of the superpowers to prevent proliferation likely is incredulous to others. The belief by many nations that proliferation adds to deterrent strength likely is considered unfounded by others since such weapons would be in the hands of stable governments as well as governments with unreliable leadership. That some nations can develop technologically advanced conventional and nuclear weapons by 2010 (or even before the turn of the century) by using indigenous scientific and technological capabilities remains a clear probability.

The continued proliferation of conventional and nuclear weapons over the next several decades and the resulting decline of the 20th century superpowers, nonetheless, must be considered the responsibility of the superpowers themselves. The continued adversarial relationship of the United States and the Soviet Union and the inclination of each toward one-upmanship in their arms race competition during most of the 20th century had transcended beyond their need to protect their security interests and, essentially had divided almost all other nations or client states into two armed ideological camps. Chances are good that many nations, which by 2010 could be achieving an economic growth unprecedented in their histories, will at the same time possess a capability by which they could destroy their economic competitors by military means rather than by peaceful economic strategies. These nations are aware of this reality and they assign blame to the 20th century superpowers. In all probability, they believe that had

the superpowers been more inclined to provide economic guidance and assistance instead of arms, the prospects and intent to use them likely would not exist.

An increase in nuclear weapons proliferation throughout many of the world's nations likely will change their national and international political perspectives, increase their assertiveness in the international arena, and lessen US or Soviet means to control the behavior of these new nuclear armed nations. By 2010, the probability could exist that ballistic missiles and nuclear weapons in the hands of small states could warp their traditional power perceptions and prompt one or more of these nations to upset regional power balances by threatening their use.[45]

Also contributing cumulatively toward the general decline of the influence of the superpowers has been the increasing disapproval by other nations of 20th century superpower political and military intrusion and intervention into the affairs of less powerful nations where successful outcomes, as defined by the involved superpower, are questionable. Moreover, increasingly there is a disillusion by many nations concerning the US or Soviet ability to mediate successfully armed conflicts which sporadically occur in Africa, especially, and, to a lesser extent, in the Middle East and Latin America.

The military capabilities of the 20th century superpowers, however, may well continue to exceed those of any other rising world power in the 21st century. Japan, however, "clearly will have the basic technological and economic wherewithal to compete with the United States and the Soviet Union"[46] as will possibly China sometime beyond 2010.

The Impact of World 2010 on US National Security. The likelihood of the United States progressing into a world 2010 environment as described in this report is a good possibility. The forecasts of the consequences of the trends addressed in the report are directed toward a construct which, at a cursory glance, suggests that the United States is a second-rate power. This, however, is not true since the decline of power is measured in 20th century terms or definitions of power. The United States in world 2010 is not dominated by isolationism; it is thoroughly enmeshed in world activities politically, sociologically, economically, and especially scientifically and technologically but less, in many respects, militarily. Although 20th century US economic, political and military influence appeared to decline, US influence in the first decade of the 21st century is strong and any decline appears remote. The 2010 world environment likely will be one of apprehension. Nations, in general, will be quite well armed and engaged in highly competitive economic activities. Compounding the real or imagined anxieties will be the possibility of armed conflict since the devastation of wars in all likelihood will have grown out of the corporate memory of most nations, including the United States.

The progression of the world toward a 2010 environment likely will demand continuous scrutiny by the US leadership. A restructuring of US national security in the light of the new order of nations and their

expanded economic configuration likely will be necessary as well. Almost certainly as a first step, the general US citizenry will have to accept and comprehend the realities and responsibilities of being a 21st century postindustrial society in order to understand why it wants to defend that society. As a second step, the United States will have to consider what national challenges and security threats might come about in a world 2010 environment. In all likelihood, the United States will have to address its societal organization and its institutions as to how world 2010 might change them, as well as consider how its position of world leadership will be affected and how its strategy of national security must be adjusted to the new international environment.

The Evolution to Postindustrial. The evolution of the US society from advanced industrial to postindustrial actually began some time after mid-20th century. Increasingly, US demographics have depicted an aging population with fewer available young males, age 18-24, than females and a population declining in number in absolute terms.[47] The American work force from mid-century on, as well as becoming on the average older, became increasingly more professional, innovative and creative, and more scientifically and technologically oriented. Moreover, more private enterprises and the government became involved in science/technology-based service, information, and knowledge industries in which international mobility and multilingual capabilities for the work force increasingly were becoming dominant features. From the mid-20th century on, US heavy industries became fewer, as light, automated and robotic fabricating enterprises replaced them. The United States gradually evolved as a postindustrial society, with all of its ramifications. The entire nation must demonstrate a resolve to assume world leadership in the face of new 21st century national challenges and security threats.

US National Challenges. Surmounting national challenges in the long term likely will tax the nation's intellectual capacities, its innovativeness and creativeness, as well as demand the most of its planning and decisionmaking skills in a broad spectrum of activities. The challenges, as deducted from the 2010 scenario, can be expected to fall into several categories, the foremost of which is a national educational system, followed by those of a national economy, a national defense, and national scientific and technological efforts.

o National education. The principal challenges to a national educational system are:

- to create and implement a national educational policy that does not infringe on States' rights.

- to establish comprehensive national educational programs that will be dedicated to provide service and support to the United States and to maintain it as the world's primary postindustrial leader.

- to adjust all programs, over time, for the preparation of learners to support the needs of a national sociopolitical and socioeconomic infrastructure that is predominantly service, information, and knowledge oriented.

These challenges, in all likelihood, might be met by the following national actions. The national educational policy will recommend accelerated, yearlong, nongraded, abilities oriented, nonformal educational programs. Further, programs will be open ended for life-time learning and retraining and will offer a wide range of educational opportunities.[48] Throughout all public schools, the educational programs for each level and every subject likely will integrate the learning and participative use of computers, computer technology, and the intellectual technology of models and simulations. Advanced learning techniques and computer assisted instruction, most likely, will be used for basic skills in reading and writing and especially in mathematics, the sciences (including technology), history (ancient to modern), languages (the average student will be proficient in at least six foreign languages), philosophy (Aristotle to modern), and logic (practical to abstract). Special learning facilities likely will be available and appropriately designed and equipped to provide wraparound audiovisual and other sensations for realistic learning experiences that will nurture innovativeness and creativity. The overall national educational programs also will recommend specially designed technical and vocational schools that will be equipped with the most advanced technology appropriate for producing a work force fully capable of supporting the needs of automated and robotic, light fabricating specialty enterprises as well as the technoagricultural industries.

o National economy. Inferences within the 2010 scenario suggest that the United States likely will be confronted with more challenges to the US economy and its management in the foreign sector than in the domestic. Since the transition of the US economy from industrial to postindustrial has been an evolutionary process, unfolding mostly during the 20th century, adjustments in the domestic economy (private and public) to accommodate the postindustrial society likely were evolutionary also. The reality of the 2010 scenario is the impact of a growing global free-enterprise environment on the US national economy.

The scenario describes a new order of nations whose economies and their management likely will influence the US economy. Other postindustrial nations, however, will exist in 2010 that will be in competition with the United States. Although they will not be unfriendly, they likely will seek to further their own interests and objectives independently. Additionally, the scenario describes advanced and transitioning industrial nations from which the United States will import many high-tech products for its service/information/knowledge industries and considerable amounts of natural and synthetic food products, clothing, and chemicals for its general public's consumption. The scenario also describes industrial nations from which the United States will import its needs in heavy industrial products (e.g., construction products, transportation vehicles) and its additional needs in agricultural products. The United States, in return, can be expected to export to these nations information and knowledge and related products as well as automated and robotic products.

The challenges to the US national economy, more specifically, are primarily to preserve a high economic growth rate; maintain a low trade deficit; manage capital flow; encourage world free-enterprise economies; discourage trade restrictions, protectionism, trade embargoes, and trade wars; and reclaim a leading edge in world economic power.

These challenges could be met, in part, by the following national actions. The creation of additional incentives through the Overseas Private Investment Corporation to promote investments abroad by US industries and financial institutions in the industries and markets of the industrial nations (e.g., in advanced technology programs, joint private commercial space programs) and in the preindustrial nations. The United States should encourage the International Monetary Fund and other national and international institutions to continue to support debtor nations, not only through financial assistance programs, but also through socioeconomic guidance programs (e.g., assistance in restructuring domestic economies, loan extensions, international investments, and guidance in social/political reform).[49] Additionally, as part of an economic development strategy, the United States should encourage and provide incentives for new and expanded private contributions (e.g., private US foundations providing funds) to preindustrial nations for culturally and environmentally appropriate research and exploration in technologies, which could result in the emergence of a new pattern of industrialization for these nations.[50] Further, the United States could develop regional economic integration programs to help (new) industrial nations reinvest capital to reduce unemployment and achieve their full potential. It could begin programs in the United States and in-country to train indigenous professional people in marketing and service and how to use new information more effectively. As a general rule, the United States should provide more economic development aid than it provides emergency relief to the industrial and preindustrial countries. Moreover, the United States, in the world 2010 setting, probably could offer to provide cooperative industrial assistance to the Soviet Union and its new leadership in an effort to improve the Soviet economy and create a better understanding and relationship of the two cultures.

o National defense. The inferences of the world 2010 scenario are that the postindustrial military establishment is comprised of active forces that are small in number, highly mobile, have high-tech sophisticated arms and ancillary equipment, and are fully capable for land, sea, air, and space contingency operations. The scenario also infers that the postindustrial nation has a reserve component that is large in number, less mobile, equipped much like the active force, and fully capable for land, sea, and air contingencies inappropriate for the active forces. Additionally, inferences in world 2010 suggest that basing rights and overflight rights have been reduced or denied to the United States by the industrial and the preindustrial nations.

The principal challenges to the US national defense that are detectable in the world 2010 scenario are:

- to acquire and train appropriate manpower to staff a professional postindustrial military establishment, i.e., active and reserve forces and their civilian support;

- to devise superior national defense and military operational strategies to compensate for universal access to technology;

- to recommend and obtain appropriate advanced weapon systems and other necessary means to support its national and military strategies; and

- to select and retain, where possible, relevant basing facilities and devise means for the rapid deployment of forces to accommodate political needs within the national and military strategies.

These challenges to US national defense likely can be met, in part, by the following national actions. The military must create professional incentive recruitment programs, not unlike those used by the 21st century American service/information/knowledge industries, to acquire superior professional manpower commensurate to the needs of the 21st century US postindustrial society. The quality of military personnel should be no less than that of the personnel of American industries. By 2010, the national educational programs likely will be producing sufficient high quality graduates for all levels and divisions of the postindustrial society including the military for national defense. The high standards of excellence in performance, competency, and moral and ethical principles expected of personnel entering the work force of the US postindustrial society should be the same for the military establishment. A need for universal military service will be unlikely so long as military pay and other benefits remain comparable to those of the postindustrial industries. The military, additionally, also must devise and provide the specialized training programs for its active and reserve forces that not only will be appropriate for the anticipated contingencies that might arise in a world 2010 environment but also will be challenges to high-caliber personnel. Training programs, for the most part, likely will be high-quality cost-effective simulations.

Since all nations have the opportunity in world 2010 to share the advantages of the most advanced technology, including weapons technology, the US military must devise superior military strategies for the defense of the nation and for protecting its interests. Advanced military training programs would have to be designed to use these strategies in an effective and superior fashion which would assure decisive actions whenever and wherever their use might be required. Moreover, as the new strategies are devised they, in all probability and increasingly, will challenge research and development to produce new and innovative weapons and weapon systems that are appropriate for specific strategies and contingencies. The choice of the weapons and systems and the manner of their employment within the national and military strategies will be the surprise and key elements to the success of any US engagement with any adversary.

o National scientific and technological efforts. US scientific innovations and technological achievements during the 20th century have been the prime movers that influenced the changes of the US society from

industrial to postindustrial. In all likelihood, the momentum of discovery will continue as well as increase in the new century. World leadership in science and technology, however, is not held by the United States alone but shared competitively with the other 21st century postindustrial societies, especially Japan. Many of the most significant achievements of the past have related to the national interests of these individual nations and were adamantly protected. With the advent of communications satellites and the increasing dissemination of information and knowledge along with increasing worldwide use of computer technology, national interests had to give way to the sharing of these advances with all nations having a science and technology infrastructure. The inferences of the world 2010 environment are that these benefits, which emanate mostly from the postindustrial and advanced industrial nations, will be available to all nations and almost all nations have the appropriate infrastructures to use the advances except the very poorest of the preindustrial nations.

The challenges to US national science and technology are many and significant to the US national interests and security. The following list is incomplete but suggests some of the foremost challenges to US science and technology (S&T). They are:

- the competition for world leadership in S&T;

- the lack of comprehensive programs to manage the free flow of US S&T information and knowledge;

- the broad transfer of S&T related to conventional and nuclear military capabilities that is legitimately transferred with other information and knowledge;

- the proliferation of nuclear S&T as the use of the nuclear energy sources increasingly replaces fossil fuels;

- the significant number of world problems related to S&T that have not been solved (e.g., pollution, alternative energy sources, bioengineering and genetic engineering hazards, space clutter, nuclear waste disposal);

- the management of space utilization (industrial/commercial, medical, telecommunications, and so forth).

These challenges probably can best be met by establishing new national departments specifically designed to address related challenges and by the following US actions:

- to develop comprehensive national S&T policies and strategies in order to maintain US leadership in a world where information and knowledge are shared by almost all nations (This includes strategies and appropriate programs for dissemination and exchange of US scientific and technological information with selected countries that most benefit the United States.);

- to encourage worldwide participation in the pursuit of the peaceful use of S&T on earth as well as in space;

- to assist all nations in the development of S&T for the benefit of mankind and, especially, to aid the preindustrial countries in the acceptance and assimilation of S&T into their societies;

- to lead in the development of cooperative worldwide programs in a search for alternative energy sources;

- to support and increase effective industrial/commercial uses of space (e.g., medical, communications, weather and weather modification, terrestrial and extraterrestrial mapping);

- to take global responsibility for leadership to rectify environmental pollution (e.g., acid rain, nuclear contamination hazards, industrial chemical pollutants, potential bioengineering hazards, space clutter);

- to support programs to perfect artificial intelligence which will increase the utility of robotic devices;

- to develop programs designed to perfect genetic technology where organisms are used to increase agricultural capabilities for the production of food, mining extraction processes to obtain pure metals, and to develop means for recycling and recovering scarce minerals, or, in medicine, to alter animal or human cells to eliminate genetic diseases;[51]

- to create new national programs to perfect unique means for the most effective utilization of the space environment for national, commercial, and other purposes; and,

- to assist the industrial and preindustrial countries to develop S&T infrastructures and to encourage their experimentation to further their own special interests.

US National Security Threats. The inferences of the world 2010 scenario suggest that US national security threats by the year 2010 almost certainly will be different than those which confronted the United States in the 20th century. In all likelihood, the manner by which the nation confronts threats to its security and provides for its defense also will be different. Military traditionalists likely will have disappeared from the 2010 scene. Those who view security and defense as an integral part of a strong economic and political infrastructure that is sustained by superior national and military strategies likely will dominate the US defense rhetoric.

The defense posture for US national security will be designed to meet the needs of the 21st century US postindustrial society. The inferences of the world 2010 scenario indicate that this force will continue to be nuclear armed but with fewer nuclear weapons; will be small in number and possess sophisticated high-tech conventional and nuclear capabilities; will be trained and equipped to deploy rapidly worldwide for land, sea, and air

operations as well as in and from space; and will be backed up by a highly trained, large reserve component. Essentially, the 2010 US military force and its potential for effective combat capabilities will continue to serve as a deterrent to any intensity or level of attack or threat against US national security interests.

The world 2010 inference that the new leadership of the Soviet Union has turned to internal economic development and away from adventuresome and aggressive acts supports the rationale for the US military as described for the world 2010 scenario. However, US defense leadership must keep in mind that the world 2010 Soviet Union retains a military force in the Soviet European sector that is nearly comparable to US capabilities. A discontinuity of the Soviet trend toward economic development, as described in the world 2010 scenario, caused by a replacement of the Soviet leadership by an aggressive faction, almost certainly would require US military planners to be prepared with appropriate contingency strategies. A Soviet threat to the United States could be lessened through an offer of the United States to assist the Soviet Union in its economic development and probably considerably lessened if the Soviet Union were to accept the US offer. Such a situation, were it to occur, likely would improve the relationship between the two nations including the mutual understanding of their cultures. Moreover, the development of a cooperative spirit between the two nations, especially if they were to cooperate in the prevention of nuclear conflict between other nations possessing nuclear weapons, likely would decrease their mutual fear of one another.

The world 2010 scenario confronts the United States with a multiplicity of threats to its national security interests but only if they are thought of in 20th century terms and situations. Unlike the threats of the 20th century, which were predominantly political/military in character, those in the early decades of the 21st century likely will be political/economic in character. Nonetheless, although these threats likely will be tempered in comparison to military threats, they almost certainly will demand considerable attention and innovativeness on the part of the US leadership. Moreover, to meet the world 2010 threats and maintain an emphasis toward long-term world peace, the United States will have to interchange its reliance on strategies of military force as power to a reliance on strategies of economic influence as power. The United States, however and in all likelihood, will retain its position as the foremost military power of the world despite its apparent loss of military influence during the latter years of the 20th century as inferred in the world 2010 scenario. The US military image in the world 2010 environment very likely will be one of quiet military power.

Unlike the national security strategic systems of the 20th century, which were designed primarily to protect and counter threats to weapons, the strategic systems in 2010 will be designed to protect US citizens, property, and institutions. The US leadership likely will confront the threats of world 2010 in a manner appropriate to regaining and protecting its position of world leadership and influence that was derogated in the waning years of the 20th century. Another important consideration for US leadership inferred by the 2010 scenario is that US plans of the 1980's and the early

1990's for a strategic defense initiative did not materialize. The United States likely will remain vulnerable in 2010 to some degree to the threat of a missile attack that is beyond the capabilities of its ground-based antimissile systems, even though, in all probability, they will be supported by superior space warning capabilities. Additionally, US leadership must be aware that the diminishing probability of large land warfare, similar to World War II, along with the decline of heavy industrial capabilities, in all likelihood, will render 20th century national industrial mobilization an archaic and obsolete concept--an anachronism in the context of the US postindustrial society in the world 2010 environment.

The likely and important threats, fears, and serious problem areas for US national security interests which confront the US leadership in the world 2010 scenario are listed below:

- Trade wars and wide spread protectionism.

- Loss of economic influence to Europe, Japan, and the Organization for Economic Cooperation and Development (OECD) nations.

- Loss of the 20th century industrial base and national mobilization capabilities.

- The build up of the Soviet economy.

- Soviet-Japanese cooperation for resources.

- New bilateral economic and political arrangements between China and Japan, China and Europe, Japan and Taiwan, Israel and South Africa, Soviet Union and Europe.

- New collective economic and political agreements of Japan, Australia, and New Zealand; Cuba and the Central American and Caribbean states; Argentina, Brazil, and Mexico.

- Expanded European interests in the industrial and preindustrial countries.

- The tenure of new Soviet leadership and a possible return to a more traditional and aggressive Soviet leadership.

- A failure of science and technology to develop alternative energy sources to support national needs.

- A concerted Soviet effort to regain hegemony in East Europe.

- Universal transfer of critical science and technology.

- Unmanageability of the constant accumulation of space clutter.

- Widespread (worldwide) experimentation in bioengineering and genetic engineering.

- Worldwide increase in the accumulation of nuclear and other industrial wastes as well as solid wastes and their disposal.

- Loss of US military overseas-basing and overflight rights.

- Reduced worldwide US military presence.

- Denial of access to or restrictions of the freedom of use of commercial and military lines of communication.

- Increased arms trade by other than the United States, the Soviet Union, and Europe.

- Increased number of conventional and sophisticated conventional arms suppliers.[52]

- Increased proliferation of sophisticated subnuclear precision weapons and ballistic missiles.[53]

- Nuclear weapons in the Middle East.

- The general proliferation of nuclear weapons.

- The possibility of preemptive military actions of one nation to forestall or preclude the production of nuclear weapons by another.

- Degradation of US collective security agreements.

- Increased Japanese militarization and a nuclear armed Japan.

- Continued destabilization in the Middle East by Islamic fundamentalists and other radical factions.

- Reduced access to critical and strategic resources.

- The probable increase in aggressiveness by those industrial nations unable to muster supporting infrastructures to advance to more modernized nations and which harbor deep vexations and hostilities toward other nations.

Implications of World 2010 for the US Army. The scenario of a world 2010 propounds many suggestions relative to the US military which will be appropriate for the 21st century postindustrial society and which likely will have implications for the land forces of the US military. The world 2010 inferences include broad comments about the US military related to its size, mobility, equipment, weapons, and the environments in which it has full operational capabilities.

Inasmuch as the world 2010 scenario does not make a clear distinction between the military services, any one of three possible configurations of a US military appropriate for the US postindustrial nation could exist:

o The US armed forces in the year 2010 could be unified into one US defense force. The probabilities of this occurring by the year 2010 are good considering the scenario's suppositions that the US military is a small and elite fighting force capable of land, sea, air, and space operations. Certainly, for such a configuration, the elimination of redundancy of missions, equipment, weapons and manpower requirements would be relevant to a postindustrial society that has modernized and slimmed down its institutions as one result of long-term deficit reduction programs. Moreover and in all likelihood, a unification of the armed services would be in accord with the characteristics of the challenges and threats to national security as they are postulated in the 2010 scenario.

o The US armed forces in the year 2010 could be comprised of three elements: a land/air fighting element, a sea fighting element, and a space capable element. The probabilities of this occurring by 2010 are better than even, and essentially for the same reasons as a unification to one defense force. The choice to retain a separate naval element likely would reflect the US leadership's interpretation of the 2010 challenges and threats. They likely would decide that there is a need for an extended military arm to replace the loss of US overseas-basing and overflight rights and to deploy land forces. They also might decide that a need exists to use US naval presence and force in any US-Soviet cooperative arrangements to preclude the employment of nuclear weapons that have proliferated into the industrial and preindustrial nations. The US space element would serve primarily intelligence and other required war-fighting needs as well as have limited antiballistic missile defense capabilities.

o The US armed forces in the year 2010 remain basically unchanged from their configuration of the 20th century--a land army, a navy, an air force, and a space command. The probabilities of the armed forces remaining unchanged are less than even considering the world 2010 suppositions that the military force of the postindustrial societies is a small and elite active fighting force, which is supported by a large reserve force capable of handling contingencies inappropriate for the active force.

The significant implications for the land fighting forces in any of these configurations can be expected to have similarity to a projection of the US Army into the context of the world 2010 scenario. The paragraphs below highlight some of the likely implications for the Army that could be expected in the world 2010 environment.

o The Army almost certainly can expect to experience a shortage of available 18-35 year old males by the year 2010. For this reason primarily, the Army will enlist and commission more qualified older men, ages 25-40 years, and younger women, ages 18-30 years. To acquire the numbers and quality of personnel needed, the Army will continue to face keen competition with postindustrial businesses and industries even more rigorous than in the 20th century. The Army, moreover, will have to develop employment strategies as well as match salaries, benefits, and other professional satisfactions of career status for its active and reserve components that

will be comparable to those of the postindustrial industries. Most of the active Army's soldiers will have college degrees or equivalent and will be offered, cost free, opportunities to earn specialized higher technical and academic degrees. On the average, the world 2010 soldier will be fully capable of comprehending and operating automated, robotic, and computerized systems and highly competent to participate in multilingual computer and video teleconferencing networks, as well as to teach and train others in the use of specialized military-oriented high-tech equipment and weapons. Additionally, the world 2010 soldier will be required to become proficient in the logic of planning, evaluating, and designing appropriate military tactics and strategies through extensible computerized military gaming programs, systems, and models. The 21st century Army will be challenged to develop its small elite forces into cohesive fighting units fully capable of effectively fulfilling a variety of combat missions when called upon.

o The world 2010 Army can be expected to have experienced the effects of long-term national deficit reduction programs. The results of these programs likely will force the Army, during the period prior to the year 2010, to develop and adhere to programs emphasizing a reduction of the active force and an economy of force. The quality of Army personnel, in all likelihood, will be the Army's first priority since they will be responsible for developing the Army's strategies and plans necessary to fulfill its missions. Training and education will be the Army's second priority, inasmuch as the employment of appropriate strategy and the effective use of weapons will be the means by which conflicts will be suppressed or won. The Army will have to develop advanced training methods using computerized high-tech simulators and other computer assisted instructional methods to create highly effective elite fighting units. Insomuch as the United States has experienced a loss of overseas training areas as well as basing rights, simulators likely will be used for a variety of environmental conditions in which combat might occur in the world 2010 scenario. High-tech equipment and weapons will be the Army's third priority. To function effectively as an elite fighting unit, the Army's equipment will have to be light and durable, low in maintenance, air and space transportable, and energy efficient. The Army will require weapons that will be mostly manportable, with built in automatic range and target seeking capabilities, self-energizing, and have variable incapacitating to lethal capabilities.

o The Army reserve components in world 2010 will continue to have a close relationship with the Army's active force as it did in the 20th century. The reserve components, however, will be considerably larger in numbers than the active force. They will maintain training and readiness for call up operations anywhere in the world where a major conflict might occur that is beyond the missions of the active force. In all likelihood, the world 2010 Army will continue to be involved in national military assistance programs. Beyond its contingency missions, the reserve component will fulfill these obligations in the world 2010 environment and will assume the responsibility by providing small units to these assistance programs.

Conclusions. The world 2010 scenario discusses a probable environment that could come about if the trends of the 20th century continue. The trends leading to this environment will create change and likely will demand

discarding old traditions and beliefs and adapting to new situations and challenges. The US leadership would almost certainly have a different outlook on its international relations, readdress its 20th century alliances and agreements, make new commitments and find the need for ad hoc alliances, as well as restructure its national security strategy and the employment of its military forces if such a world environment were to come into being.

The application of military force as an instrument of national power also would be reassessed and the use of the Army almost certainly would be highly selective. Moreover, US contingency strategists and planners in 2010 must assume that potential adversaries possess and their military understand the use of the high-tech weaponry of 2010. They must also be aware that the adversary will have capabilities analogous to those of the US forces. US strategists and planners, then, must devise strategies and operations that have high potential for defeating an adversary through the element of surprise. The strategy would include an operational plan where surprise combinations of high-tech weapons and advanced technology would be used against an adversary. Although the world 2010 environment suggests few instances of wars, it is so competitive that conflicts could occur. There appears to be no need for the United States to apply military force as an instrument of national policy in the world 2010 scenario. The reason that the world 2010 scenario was created was to alert planners and decisionmakers that situations exist that they can alter or manage in the years prior to the year 2010 which could make the future environment more acceptable to the United States, its allies and friends.

ENDNOTES

1. This futures report creates a scenario that describes a probable world environment that could well be forming by the year 2010. The arrangements of nations are based on the author's interpretation of the trends of the 1980's; they do not mean that the nations within these groupings are immutably aligned with one or the other camps; they are merely a convenient typology appropriate for this scenario. This scenario is not the only one futurists could design for a world 2010; others have chosen either decidedly pessimistic or optimistic scenarios. In establishing an approach to the world 2010 scenario the author considered the Malthusian theory of 1798 (T. R. Malthus, An Essay on the Principle of Population, edited with introduction by Anthony Flew, Penguin Books, 1970). The Malthusian theory remains the position of the "catastrophic" or neo-Malthusian theorists (e.g., D. H. Meadows, and others, The Limits of Growth, Universe Books, 1972) who predict scarcity, misery, doom, and collapse of society. The opposing position is held by the "cornucopian" theorists (e.g., Herman Kahn and Julian Simon, see Constance Holden, "Simon and Kahn versus Global 2000," Science, Vol. 221, No. 4608, July 2, 1983, pp. 341-343) who predict that human ingenuity and innovative technology will permit indefinite improvement of human well-being, and that the earth's carrying capacity is essentially boundless. This scenario, "A World 2010," falls between these two theories, it favors the cornucopians but recognizes that within some nations and regions of the world there could well be misery and eventual collapse of nations.

2. Raymond D. Gastil, "The Comparative Survey of Freedom 1986," Freedom At Issue, No. 88, January-February 1986, pp. 14-16, describes the political and economic systems of nations as they relate to each nation's political and civil freedoms. Gastil scales political systems from democratic multiparty to absolute one party and nonparty, and places the world's nations into three types: Euro-American, Sino-Soviet, and traditional, "bits and pieces" of the other two. Gastil's economic systems are scaled from capitalist to socialist with various mixes in between.

3. There also exist transient groups that are essentially non-nations and are based on political fundamentalism, ethnic, or religious principles, as well as economic cartels; none of which are discussed in this report. Additionally, the effect that multinational corporations would have on trends and their impact on national actions is not discussed in this report.

4. Nations of the world have been variously grouped in the past: industrial and agrarian; developed and developing or underdeveloped or less developed; more developed, developed, and less developed. Sociologist Daniel Bell (The End of Ideology, New York: Crowell-Collier, 1961) has added the postindustrial state; Herman Kahn and Anthony J. Wiener (The Year 2000: A Framework for Speculation on the Next Thirty-Three Years, New York: The Macmillan Company, 1967) conceived five classes in the year 2000 according to arbitrarily predicted levels of annual income (see below); Willis W. Harman (An Incomplete Guide to the Future, San Francisco: W. W.

Norton & Company, Inc., 1979) used the term transindustrial; while Yoneji Masuda (The Information Society As Postindustrial Society, Washington: World Future Society, 1981) and John Naisbitt (Megatrends: Ten New Directions Transforming Our Lives, New York: Warner Books, Inc., 1982) have replaced postindustrial with, they believe, a more accurate descriptive term, the information society. Sociologists and demographers have also referred to the First, Second, Third, and Fourth worlds as categories. Leon F. Bouvier ("Planet Earth 1984-2034: A Demographic Vision," Population Bulletin, Vol. 39, No. 1, Washington: Population Reference Bureau, Inc., 1984) classifies nations into four types: service/information societies, new industrialized nations, developing nations, and least developed nations.

Five Levels of Income and Industrial Development in the Year 2000*

1. Preindustrial	$50 to $200 per capita
2. Partially industrialized or transitional	$200 to $600 per capita
3. Industrial	$600 to perhaps $1,500 per capita
4. Mass consumption or advanced industrial	Perhaps $1,500 to something more than $4,000 per capita
5. Postindustrial	Something over $4,000 to perhaps $20,000 per capita

*(Kahn and Wiener, p. 58.)

5. The categories of nations in this report are an attempt to "fine tune" what could be realized as early as the year 2010; the transition is already occurring for some nations The categories differ especially from Kahn and Wiener in that this author believes that there will be few, if any, nations acquiring an infrastructure to transition from the preindustrial to "partially" industrialized and that a clearly recognizable transition, more than likely, will be between the industrial to the advanced industrial societies. That nations will be aligned in new political and economic orders in the future is almost certain; that the new alignments will occur by the year 2010 and be recognized by all nations is less certain. This author believes that 2010 is the earliest that strong evidence of the new order will be recognizable and that full transformation of a new world paradigm probably will reach fruition by the year 2040 or 2045. The groupings of the world's nations, however, are likely to be somewhat different than arranged in this paper depending on how world leaders manage, alter, or otherwise change the course of world trends.

6. Adapted from Graham T. T. Molitor, "The Information Society: The Path to Postindustrial Growth," in Communications Tomorrow: The Coming of the Information Society, edited by Edward Cornish, Bethesda: World Future Society, 1982, p. 85. Also adapted from Masuda, pp. 29-33.

7. Adapted and projected from Gastil, p. 7-9 and elsewhere. Annually, Gastil publishes a comparative survey of freedom (since 1973) of nations of the world. Nations are rated against scales for political and civil freedoms, with a political free baseline of a fully competitive electoral process where those elected clearly rule, and a civil liberties baseline

where freedom of public expression for political change is not closed and where courts protect individual expression. Gastil includes a partly free category where there is overlapping of either political or civil freedoms (see Gastil p. 7). Gastil's comparative surveys present only his estimates of the current year's situation and the progress made toward freedom; he does not forecast the probability of freedom. Such projections for the world 2010 are those of the author of A World 2010 and are based on the author's estimates of the economic and political potential of nations. Although Albania and Bulgaria are unlikely to achieve the status of a postindustrial states, they are symbolically carried along with the Eastern bloc nations to complete the general notion of the world 2010 scenario.

8. There is another possible projection regarding Hong Kong. Some Asian analysts believe that China does not and will not have the capability to manage the intricacies of the Hong Kong economic structure. They suggest that before 1997, when Hong Kong will reunify with China, most of the lucrative assets of Hong Kong will have departed the territory, and China will move in to expropriate an empty shell.

9. Bouvier assumes Taiwan and Hong Kong as part of China in 2034. He also would include China and Korea (North and South united) as close to the service/information borderline, p. 29. A Delphi forecast survey conducted in 1984-85 at the US Army War College, which used defense-oriented respondents, found that of 124 panelists, 88.7 percent forecast that Taiwan would accede to unification with China but would retain, by agreement with Beijing, its democratic and capitalist systems during the period 2005-2010 (p. 15) or at the earliest, 2000-2005 (p. C-4). The balance of the panelists believed that this would occur but later than 2030 (4.8%) or would never happen (6.5%)(p. 15). (Charles W. Taylor, Pilot Delphi Project, Part I: Project Summary, Carlisle Barracks, PA: US Army War College, 15 December 1985, pp. 15 and C-4. Referred to hereafter as Pilot Delphi.)

10. Gastil rates South Africa as being partly free, pp. 9 and 12. This writer doubts that South Africa can achieve clear political or civil freedom by the year 2010; although it probably will make positive strides toward freedom, it will remain partly free.

11. Taylor, Pilot Delphi, pp. 15 and 22. This Delphi forecast survey found that of 128 panelists, 93.8 percent forecast that a populist revolution would occur in Mexico which could result in a markedly left-wing regime, hostile to the United States coming into power during in the period 2000-2005 or even as early as 1995-2000. Taylor also points out (p. 22) that two other Delphi surveys ("Project Outlook," University of Southern California, 1982, and an Army Delphi forecast, 1984) forecast the probability of this event occurring as early as 1987-1991 and 1994, respectively.

12. Although the Philippines are presently under the leadership of President Corazon C. Aquino whose apparent intent (as of 10 July 1986) is to establish a free and Western-like democratic society, insufficient evidence of the permanency of the Aquino government exists to assign the Philippines a descriptor of "politically free." However, despite the sincere efforts

being made by the Aquino government, the 1985 Delphi project conducted at the US Army War College forecast that 100 percent of 135 panelists believed that a leftist regime could gain control of the Philippines and demand that the United States abandon its military installations early in the period 2000-2005. (Taylor, Pilot Delphi, p. 15.)

13. Although it is possible that some of the smaller preindustrial and, perhaps, some of the nonindustrial states, will be absorbed into new or larger states beyond 2010, based on the world's configuration of United Nations' countries in 1986, the 14 countries rated politically free include: Botswana and Mauritius in Africa; Cyprus in Asia; Dominica, Dominican Republic, Jamaica, St. Lucia, Grenada, St. Vincent, and Trinadad and Tobago in the Caribbean; Ecuador and Peru in South America; and Papua New Guinea and the Solomon Islands in Oceania.

14. This report uses demographic data projected 24 or more years extracted from the 1986 World Population Data Sheet by Mary Madieros Kent and Carl Haub, Washington: Population Reference Bureau, Inc., April 1986. The world's total population of ca. 7.0 billion for the year 2010 was extrapolated from this data sheet. The numbers are relative and are not crucial to the analysis of this report. They are used merely to establish a probable view of the world in 2010 if trends of the 1980's continue into the 21st century. (See Leon Bouvier, "Projections: Always Right, Always Wrong," Intercom, Population Reference Bureau, Inc., November/December 1983, pp. 8-9, for a discussion on numbers used in projections.)

15. Kent and Haub, 1986 Data Sheet, "Definition of Terms": Total Fertility Rate (TFR): The average number of children a woman will have assuming that current age-specific birth rates will remain constant throughout her child bearing years (roughly ages 15-49). Depending upon mortality levels, a TFR of 2.1 to 2.5 is considered "replacement" level. At this level, a population will eventually stop growing.

16. Bouvier, "Planet Earth," projects the overall average of life expectancy at birth will be 70 years in the year 2034, pp. 21 and 25.

17. Ibid., Bouvier believes that the median population age could approach 45 or 50 in the year 2034 and uses West Germany as an example (although he believes that East and West Germany will be united early in the 21st century); also, that the declining number of youth will increasingly require the nation's reliance on intelligent robots or on immigration of youth from those countries having surplus populations, p. 26.

18. Although this paper supports the trend of a gradual reduction of the heavy industrial sector of the U.S. economy over the long term, there is an opposing view: Blechman believes that the deindustrialization of America to be a myth, and that "even in those industries most severely affected (e.g., steel, autos, machine tools), there is rarely any suggestion that imports will make the U.S. completely or overly dependent on foreign sources of supply." Barry M. Blechman, Alternative Strategic Environments, 1994-2004, Alexandria, VA: Institute for Defense Analysis, P-1785, January 1985, p. II-34.

19. Bouvier, p. 29.

20. Adapted from Bruce Bueno deMesquita, "The World of Tomorrow," Bottom Line, Personal, Vol. 5, March 30, 1984, p. 13.

21. Adapted from Ann Crittenden, "I.M.F. Aid Up Sharply; Focus on Poorer Nations," The New York Times, May 13, 1980, p. D8. See also American Council of Life Insurance, "Collapse of the Global Financial Superstructure," in its Trend Analysis Program (TAP 23), Washington: Summer Issue 1983, pp. 15-18.

22. Holden, "Simon and Kahn versus Global 2000."

23. Amitai Etzioni, Presentation, "Redressed Mutuality: Beyond the NIEO," World Future Society, Fifth General Assembly, Washington, D.C.: 12 June 1984. In a reply during a question and answer period, indicated that he believed that the Latin American debtor nations will continue to be held responsible for the repayment of their debts, that they likely will be given numerous extensions over the long term, and that under no circumstances would their debts be forgiven.

24. Although this probably will be the case for newly industrializing countries by 2010, Kenneth B. Taylor has found that by the mid-1980's that there was little evidence to show that the less developed countries were making use of telecommunications technology. "The Economic Impact of Emerging Global Information on Lesser Developed Nations," in The Global Economy, edited by Howard F. Didsbury, Bethesda, MD: World Future Society, 1985, pp. 155-158.

25. Theodore J. Gordon, "The Year 2050: Reflections of a Futurist," The Lamp, an Exxon publication, Vol. 63, Spring 1981, p. 30. John Gever and others (Beyond Oil: The Threat to Food and Fuel in the Coming Decades, Cambridge, MA: Ballinger Publishing Co., January 1986.) believe that world oil production will peak around the year 2000 and that substitutes cannot fully offset the decline in petroleum before 2025. They also believe that US oil and gas virtually will be exhausted by 2020.

26. US Department of Energy, The National Energy Policy Plan: A Report to the Congress, Washington: October 1983, pp. 21-23.

27. Jose Goldenberg believes that for energy in the Latin American countries, in general, "the search for new solutions will certainly lead to an energy future that will be different from the past, perhaps less than wished by many but more than predicted by some," "Energy Problems in Latin America," Science, Vol. 223, No. 4643, March 30, 1984, p. 1362.

28. Adapted from Technology, Strategy and National Security, edited by Franklin D. Margiotta and Ralph Sanders, Washington: National Defense University, 1985, pp. 110-111.

29. Adapted from Charles W. Taylor, Scientific Innovation and the US Army, December 1, 1980, and Technological Achievements and the US Army, February 10, 1981, Carlisle Barracks: Futures Group, Strategic Studies Institute, US Army War College, p. 2.

30. Adapted from Philip Boffey, "Stemming the Flow of High Technology," The New York Times, February 28, 1984, p. C2, and adapted and expanded from Leo Young, "Protecting Our Edge," Defense, November 1983, pp. 14-17. See also Peter David, "US Academics Jib at Pentagon Secrecy," Nature, March 29, 1984, p. 389.

31. Robert Jastrow, "Why We Need A Manned Space Station," Science Digest, Vol. 92, No. 5, May 1984, pp. 41, 42, 92 and 94.

32. Adapted from Mark Washburn, "What's A Space Station Good For?" The Washington Post, April 1, 1984, p. C1. Fairchild Corporation is planning to launch such a platform by NASA shuttle or by a commercial launch as early as 1987; the facility will be called "Leasecraft." The National Commission on Space appointed by President Reagan in 1985 proposes a $700 billion space program to manned settlements on the Earth's moon and on Mars and up to 1 million space travelers a day by 2035 in its "Pioneering the Space Frontier: Our Next 50 Years in Space" report. The Business-Higher Education Forum in its report ("Space: America's New Competitive Frontier," April 1986) recommends greater emphasis on space activities by academic institutions, business, as well as the Federal Government. The Forum also urges broader support for the NASA proposed space station, and a permanent manned platform by 1994-95. The European Space Agency (ESA) proposes an unmanned space platform and a man-tended free-flyer laboratory by the end of the 1990's (David Dickson, "Europe Plans Its Own Mini Space Station," Science, Vol. 232, No. 4752, May 16, 1986).

33. Ibid., Washburn believes that the USSR will attempt a Mars station in the 1990's.

34. US Congress Office of Technology Assessment, Soviet Salyut; Soviet Steps Toward Permanent Human Presence in Space--A Technical Memorandum, Washington: December 1983, p. 35.

35. Ibid., p. 43.

36. David Dickson, "NASA Seeks European Space Partners," Science, Vol. 223, No. 4642, March 23, 1984, pp. 1273 and 1276.

37. For this scenario, the assumption is made that the Strategic Defensive Initiative (SDI), which commenced with President Reagan's announcement of March 1983, would not be successful and that appropriations for its research would be discontinued by the year 2010. This is based on the possibility of the United States and the Soviet Union reaching some form of an acceptable arms control agreement before 2010, thereby reducing the need for SDI. Well before 2010, SDI efforts, in all likelihood, would have exerted their influence on the future. A successful SDI likely would be

destabilizing for the World 2010 scenario since it probably would increase US-Soviet arms competition. This rhetoric was supported by some of the speakers at a conference, "Security Implications of SDI," held at the American Enterprise Institute (AEI), 29-30 April 1986, in Washington, D.C., sponsored by AEI, the National War College, and the US Army War College.

38. Adapted from George Aseniero, "Technology and Development: NIEO's Quest for Technology Transfer," Ch. 8 in Transforming the World Economy?, edited by Herb Addo, Boulder, Colorado: Westview Press, 1984, p. 221.

39. During the latter half of the 20th century, significant and comprehensive advances in science and technology were made by the United States (primarily), the Western European nations, and Japan. The Soviet Union trailed these nations in original, innovative scientific and technological developments, depending more on the external acquisition of science and technology than on its own internal developments. Nonetheless, the Soviet Union made sufficiently sizable steps forward to be defined as a superpower; its status as such being confined to its influence as a military power and less to its influence as an economic power.

For most of this period, a disproportionate measure of the gross national products of these nations (except Japan) was channelled into the exploitation of military scientific innovations and technological applications and their improvements. Opportunities for basic scientific research and technological development benefiting mankind, essentially, received only moderate government support in the Western nations and, largely, were funded by proprietary interests and by academia. Lester Brown believes that the US and Soviet arms race has sapped the energies of both superpowers and that they are increasingly ceding economic power to Japan. ("Redefining National Security," in State of the World 1986, by Lester R. Brown, and others, New York: W. W. Norton & Company, Inc., 1986, pp. 200-204.)

40. Bouvier, "Planet Earth," p. 18, believes that neither "capitalism as we have known it for the past 200 years and communism as it has developed over the past 65 years" will prevail through the 21st century and that the "developing nations' demand for a New International Economic Order will meet with some success in the next 50 years."

41. Ibid. Bouvier, pp. 18-19, projects "democracy, as distinct from capitalism, will survive and thrive as it ceases to be bound by capitalist ideology" and assumes the "democratic world's emerging social consciousness will spread to include a greater sharing of the wealth with less advanced nations." Additionally, Bouvier suggests that both democracy and communism may be replaced by Ward's "Sociocracy" (from Bouvier, p. 35: Lester Frank Ward, Applied Sociology, New York: Arno, 1974, reprint of original published in 1906).

42. Bouvier, p. 24.

43. Ibid., adapted from pp. 15, 16, 27, and 29.

44. Joseph Adamek, Centrally Planned Economies in Europe: Economic Overview 1985, New York: The Conference Board, 1985, p. 11. Adamek states:

> . . . And it is on Asia and Siberia that the Soviet Union will rely to stimulate economic recovery: in Azerbaidjan, Armenia, Kirgizia, Tadzhikistan, Turkmenistan, and Uzbekistan. It is no coincidence that demographic trends pinpoint as the high population growth area of the Soviet Union that area to the immediate south of Siberia, a region which houses the Soviet Union's natural resources but one which has in the past been plagued by chronic labor shortages. The signs point to Gorbachev and his colleagues taking a wider view: sluggish economic development in European Russia is to be compensated by rapid [economic] progress in Asia.

45. See Arthur F. Manfredi, and others, Ballistic Missile Proliferation Potential in the Third World, Washington, D.C.: Congressional Research Service, The Library of Congress, ca. April 23, 1986, p. 6.

46. Herman Kahn, "Some Comments on Multipolarity and Stability," Discussion Paper, HI-3662-DP, New York: Hudson Institute, July 1983, pp. 1 and 3.

47. Charles F. Gallagher, The Shape of Things to Come, Hanover, NH: American Universities Field Staff Reports, No. 33 General, CFG-4-79, 1979, p. 1.

48. Adapted from Masuda; for a transformation of the educational system in the postindustrial society, see Masuda, pp.66-68.

49. Brown, State of the World 1986, believes that the 1985 $800 billion Third World external debt is the principal obstacle to their progress and that much of the debt never will be repaid, p. 209.

50. Adapted from Kempe Ronald Hope, "Self-Reliance and Participation of the Poor in the Development Process in the Third World," Futures, Vol. 15, No. 6, December 1983, pp. 455-462.

51. Gordon, "The Year 2050," pp. 32-33.

52. Evidence of these arms transfers is discussed by Richard F. Grimmett in Trends in Conventional Arms Transfers to the Third World by Major Supplier, 1978-1985, Washington, D.C.: Congressional Research Service, The Library of Congress, Report No. 86-99 F, May 9, 1986.

53. Manfredi, Ballistic Missile Proliferation, pp. 5-6.

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This Futures Report presents a description of a probable world environment for the year 2010--an era where the influence of the 20th Century superpowers is diminished and where new international alignments of nations are on the rise. The configuration of world 2010 places the nations of the world in five groups according to their relationship to industrialization and modernization; they are: postindustrial, advanced industrial, transitioning industrial, industrial, and preindustrial. World 2010 is based on seven trends that are likely to shape the world environment of the 21st Century.

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